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Vol. 1051 Number 4

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February 26, 1985

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

February 26, 1985 Volume 1051 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	64.00
Designation fee for 11th and subsequent designations	no charge

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 24, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Feb. 23, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,316,286 through 4,317,286

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,096,505, Re. S.N. 679,036, Filed Dec. 6, 1984, Cl. 354/246, FOCAL PLANE SHUTTER FOR CAMERAS, Eiichi Onda, et al., Owner of Record: *Seiko Koki Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Robert E. Burns, Ex. Gp.: 211

4,248,392, Re. S.N. 663,676, Filed Oct. 19, 1984, Cl. 242/099, APPARATUS FOR APPLICATION OF SHEET-LIKE MATERIALS AND FILMS, John C. Parry, Owner of Record: *Inventor,* Attorney or Agent: Walter G. Finch, Ex. Gp.: 245

4,334,690, Re. S.N. 547,646, Filed May 21, 1984, Cl. 280/11.21, TRAINER/LEARNER SKATE, Reuben B. Klamer, et al., Owner of Record: *Trend Products Group, Los Angeles, Calif.,* Attorney or Agent: Sherman O. Parrett, et al., Ex. Gp.: 316

4,365,046, Re. S.N. 683,888, Filed Dec. 20, 1984, Cl. 525/438, PROCESS TO CONTROL THE CURING REACTION BETWEEN A COPOLYESTER RESIN AND AN EPOXIDE COMPOUND, AND A COMPOSITION FORMED FOR THAT PROCESS, Patrick Pesata, Jr., et al., Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Alvin T. Rockhill, et al., Ex. Gp.: 155

4,377,882, Re. S.N. 677,365, Filed Dec. 3, 1984, Cl. 015/335, VACUUM CLEANING APPLIANCES, James Dyson, Owner of Record: *Prototypes, Ltd., Bath BA1, England,* Attorney or Agent: Ian C. McLeod, Ex. Gp.: 242

4,397,413, Re. S.N. 679,400, Filed Dec. 7, 1984, Cl. 228/174, PROCESS FOR MANUFACTURING PLASTICALLY DEFORMED LIGHT METAL OBJECTS HAVING A CONNECTOR PART OF A DIFFERENT METAL, Alfred Wagner, et al., Owner of Record: *Swiss Aluminium Ltd., Chippis, Switzerland,* Attorney or Agent: Gregory P. LaPointe, et al., Ex. Gp.: 325

4,399,282, Re. S.N. 676,248, Filed Nov. 29, 1984, Cl. 546/048, CAMPTOTHECIN DERIVATIVES, Tadashi Miyasaka, et al., Owner of Record: *Kabushiki Kaisha Yakult Honsha, Tokyo, Japan,* Attorney or Agent: Raymond C. Stewart, et al., Ex. Gp.: 122

4,472,510, Re. S.N. 682,739, Filed Dec. 17, 1984, Cl. 501/012, CARBON-CONTAINING MONOLITHIC GLASSES AND CERAMICS PREPARED BY A SOL-GEL PROCESS, James R. January, Owner of Record: *Dow Corning Corp., Midland, Mich.,* Attorney or Agent: Richard A. Kaba, et al., Ex. Gp.: 118

4,474,670, Re. S.N. 679,517, Filed Dec. 7, 1984, Cl. 252/32.7E, HINDERED PHENYL ESTERS OF CYCLIC BORATES AND LUBRICANTS CONTAINING SAME, Milton Braid, et al., Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, et al., Ex. Gp.: 118

4,481,188, Re. S.N. 682,859, Filed Dec. 18, 1984, Cl. 424/089, VACCINES, Peter Apontoweil, et al., Owner of Record: *Gist-Brocades N.V., Ma Delft, The Netherlands,* Attorney or Agent: Charles A. Muserlian, Ex. Gp.: 123

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Errata

"All reference to Patent No. 4,494,378 to Oswald O. Kytta, et al. of Ind. for 'FLUID PRESSURIZING DEVICE' appearing in the Official Gazette of Jan. 22, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,496,395 to Ernest M. Jost of Mass. for 'ELECTRICAL CONTACT MATERIAL COMPRISING SILVER, CADMIUM OXIDE AND CUPRIC SALT' appearing in the Official Gazette of Jan. 29, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,496,422 to Ronald A. Dery, et al. of N.C. for 'ANICOTROPICALLY CONDUCTIVE ADHESIVE COMPOSITION' appearing in the Official Gazette of Jan. 29, 1985, should be deleted since no patent was granted."

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

The Games Preserve, Fleetwood, Pa., Reg. No. 1,137,658, for the mark THE GAMES PRESERVE and design, Canc. No. 14,190.

The Tayston Corp., Lexington, Ky., Reg. No. 1,216,036, for the mark T TAYSTON'S COOKIE JAR and design, Canc. No. 14,207.

Family Orchards, Inc., Berkeley, Calif., Reg. No. 1,118,367, for the mark MOUNTAIN MUNCHIES, Canc. No. 14,312.

First Multifund Advisory Corp., assignee of First Multifund of America, Inc., New York, N.Y., Reg. No. 877,935, for the mark MULTIFUND, Canc. No. 14,328.

Max Lutz, dba Max Lutz Co. and Max Lutz Co., McAllen, Tex., Reg. No. 793,021, for the mark MAX PACK, Canc. No. 14,368.

Clenet Coachworks, Inc., Santa Barbara, Calif., Reg. No. 1,102,074, for the mark CLENET, Canc. No. 14,398.

National Market Equipment Co., Inc., assignee of Fred Kuhn, dba, National Market Equipment Co., Madison Heights, Mich., Reg. No. 562,869, for the mark NATIONAL, Canc. No. 14,413.

Jambor Tool & Stamping Co., Milwaukee, Wis., Reg. Nos. 239,770 and 411,191, for the mark "BULL DOG" and design, Canc. 14,425.

Edwin Clapp & Son, Inc., Boston, Mass., Reg. No. 75,659, for the mark EDWIN CLAPP and design, Canc. 14,483.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for January 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	32	Due to automation problems.
Trademarks	30	39	Due to contractor problems.
Patent/Trademark Copies:			
Window Coupons	5	98% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		January 4, 1985**	
Date being processed		January 23, 1985**	
Certified Copies:			
Trademark Registrations	30	24	
Status Copies (excluding title)	15	96% within 15 days	
Applications-As-Filed	20	98% within 7 days	
File-Wrapper/Contents	N/A	92% within 7 days	
Walk-up Certification	1	94% within 24 hours	
Trademark Search Library:			
Filing Drawings	21	44	Delays due to holidays.
Filing Reg. Certificates	3	13	Delays due to GPO Printing.
Assignments:			
Patents	25	23	
Trademarks	25	18	
Avg. Days from Issue Fee Payment to Issue Date	90–100	89	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 2 days late	
Patent Grants Mailed	Issue Date	Avg. 11 days late	Delay due to new printing contractor.
Patent Copies Available	Issue Date	98% 4 days late	Delay due to new printing contractor.
Trademark Copies Available	Issue Date	98% 7 days late	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	Avg. 6 days late	GPO failed to deliver covers on time.

*Figures include postal processing and delivery time.
**Dates are day of receipt for (1) the single oldest order and (2) the majority of orders in process.

IMPROVEMENTS TO SERVICE

As a result of the 1984 Public User Survey summarized in the Nov. 22, 1984 Official Gazette, the PTO developed an Action Plan to address problem areas. Some specific actions taken so far are these:

- *Official Searching* — The number of computer terminals used to access the automated system for locating files has been increased, as well as the number of employees serving the public during peak hours. These actions have reduced the length of waiting lines and have enhanced employees' ability to give requesters more individual attention.

  To aid the public in reporting poor, as well as excellent, service received from employees, the names of employees servicing the public have been posted, as well as the unit's supervisor. Also placed in a highly visible area is the Help Us Help You campaign poster and cards by which the public is asked to comment on the quality of services received.

  The number of days for the Official Search Unit to close out and formally notify the requester of the results of the official search process has been reduced from 30 to 15. This will improve the timeliness of the search notification and decrease the time a requester must wait prior to requesting a file to be reconstructed should the official search be unsuccessful.

  An official search status telephone line has been established effective Feb. 4, 1985. This number can be called anytime after an official search is placed to determine its status. The phone number is (703) 557–9690.

  When a requested abandoned or patented file cannot be found at the Records Center, an official search is being initiated by the PTO immediately, rather than waiting for five days, as was the prior practice.

A report identifying the locations in which "lost" files were found was issued to PTO managers and supervisors. The report also emphasized the importance of using the automated Patent Application Location and Monitoring System (PALM). It is felt that widespread publication of problem areas will lead to a greater sensitivity to this problem and improved location control. The most difficulty has been in locating files which are stored in the GSA Federal Records Center in Suitland, Md. The PTO has been meeting regularly with the GSA Records Center managers to analyze causes of unsuccessful searches for files. All boxes in the Record Center were inventoried to ensure accession numbers are properly identified.

- *Integrity of Assignment Card Files* — Regular integrity checks of the Assignment card files has been reemphasized and follow-up random sampling has been implemented. Also training for new file clerks has been reviewed and reemphasized.
- *Patented File Histories* — The greatest source of public frustration has not been with retrieval of files under the PTO's direct control, but with older files located at the GSA's Federal Records Center in Suitland, Md. The PTO is now holding files obtained from the Records Center for at least three weeks after the files are returned by a requester. This provides for quicker access to files that are of interest to multiple requesters. It also enables the PTO to return files to the Records Center in bulk, thus enhancing the possibility of a more prompt refile.

  Discussions with the Records Center management are continuing in an effort to upgrade the level of service provided to the PTO. Thus far, these discussions have resulted in the Records Center tightening their controls and standards for processing PTO requests. In addition, the Records Center has agreed to adopt our recommendation to individually track each of our requests throughout the retrieval process, and commitments have been made by the Center's Director for a more rapid turnaround of our requests.

  The amount of time a requester can have a file held for them has been reduced from 10 days to 5 days. This expedites the availability of a file to other requesters.

  Additional equipment has been installed in the File Information Unit (Record Room) for use by employees in querying the Files Repository to determine the availability of file histories. Also, an additional PTO employee is assigned during peak operating hours to respond to public requests. These actions have resulted in shorter lines and quicker service.
- *Trademark File Histories* — The responsibility for retrieving and distributing trademark file histories has been centralized under the control of one organizational unit.

  The number of deliveries and pick-ups of trademark files to and from the Files Repository has been increased from two to five trips daily, resulting in a quicker file turnaround time.

  The distribution of these files is being strictly controlled to ensure the appropriate individual receives the requested file. In the prior procedures, files ordered were placed on a table where anyone could take any file they wanted.

  A system to allow requests for trademark files to be placed in the File Information Unit near the Patent Search Room, as well as in the Trademark Search Room has been implemented. This is an added convenience to those members of the public who conduct business in both the Patent Public Search Room and the Trademark Search Room.

  Bar code labels were placed on all active trademarks and records have been entered into the new automated TRAM system. Terminals available in the Trademark Search Library allow the user to query the system and instantaneously determine whether or not the trademark is active and available in the File Repository.

HELPFUL HINTS FROM THE PTO

- *Submission of Corrected Drawings in Allowed Patent Applications* — When drawings need to be corrected in an allowed application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.
- *Requests for Allowed Patent Application Files* — Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is especially directed to out-of-town requesters who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance. Inquiries and requests should be directed to the Correspondence Section at (703) 557-6397 or (703) 557-6398 between the hours of 8:30 a.m. through 5:00 p.m. on weekdays.
- *PTO Special Boxes* — The special box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

  We have been experiencing problems with Box 9 being used for other than coupon orders for copies of patents and trademark registrations.

  The following special boxes should be used only for their specified purpose.

Address to:
Box_____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 4 — Mail for the Office of Legislation and International Affairs.
Box 5 — "No fee" mail related to trademarks.
Box 7 — Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8 — All papers for the Office of the Solicitor.
Box 9 — Coupon orders for U.S. patent and trademark copies.
Box 10 — Orders for certified copies of patent and trademark applications.
Box 12 — Contributions to the Examiner Education Program.
Box Interference — Communications relating to Interferences and Applications and patents involved in Interference.
Box M. Fee — Correspondence related to a patent that is subject to the payment of a Maintenance Fee.
Box Pat. Ext. — Applications for patent term extension.
Box PCT — Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam — Mail related to reexamination applications.

Feb. 4, 1985.

THERESA A. BRELSFORD
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 26, 1985

D. 273,786	4,433,265	4,459,128	4,467,224
D. 275,317	4,434,821	4,459,173	4,467,518
4,243,677	4,436,090	4,459,212	4,467,652
4,257,984	4,437,329	4,459,493	4,467,976
4,273,805	4,437,986	4,459,992	4,468,004
4,295,301	4,440,487	4,460,449	4,468,365
4,296,004	4,440,889	4,460,502	4,468,422
4,310,482	4,441,477	4,460,577	4,468,441
4,321,002	4,442,517	4,460,662	4,468,445
4,322,240	4,443,509	4,460,726	4,468,696
4,330,363	4,444,151	4,460,838	4,469,098
4,333,484	4,444,385	4,460,932	4,469,126
4,334,883	4,444,909	4,461,324	4,469,249
4,343,179	4,444,994	4,461,500	4,469,363
4,343,317	4,446,757	4,461,713	4,469,474
4,344,882	4,447,501	4,461,801	4,469,595
4,352,740	4,447,726	4,462,053	4,469,599
4,362,534	4,448,003	4,462,271	4,469,710
4,366,151	4,448,121	4,462,314	4,469,797
4,373,021	4,448,568	4,462,408	4,470,115
4,379,700	4,448,942	4,462,444	4,470,144
4,382,277	4,449,005	4,462,488	4,470,168
4,386,588	4,449,123	4,462,651	4,470,529
4,391,739	4,449,837	4,463,004	4,470,607
4,402,008	4,450,018	4,463,329	4,470,631
4,402,445	4,450,279	4,463,369	4,470,662
4,404,153	4,451,642	4,463,557	4,470,672
4,406,399	4,451,940	4,463,761	4,470,796
4,408,241	4,452,141	4,464,323	4,470,827
4,409,478	4,452,482	4,464,563	4,470,899
4,412,788	4,453,034	4,464,660	4,470,984
4,415,112	4,453,212	4,464,732	4,471,361
4,416,735	4,454,188	4,465,042	4,471,477
4,421,288	4,454,288	4,465,063	4,471,590
4,421,905	4,454,490	4,465,092	4,471,633
4,422,108	4,454,632	4,465,111	4,471,718
4,424,589	4,455,624	4,465,462	4,472,044
4,425,333	4,455,665	4,465,485	4,472,337
4,426,317	4,455,901	4,465,743	4,472,452
4,426,476	4,456,404	4,465,822	4,472,603
4,427,529	4,456,525	4,465,914	4,472,738
4,427,801	4,456,907	4,465,919	4,472,772
4,429,532	4,456,979	4,465,924	4,473,046
4,430,123	4,457,174	4,465,927	4,473,102
4,431,527	4,457,368	4,465,981	4,473,156
4,432,109	4,457,489	4,466,435	4,473,168
4,432,386	4,457,767	4,466,515	4,473,239
4,433,005	4,457,950	4,466,591	4,473,320
4,433,069	4,457,977	4,466,872	
4,433,154	4,458,939	4,466,873	
4,433,160	4,459,121	4,466,919	

Disclaimers

3,919,548.—*David E. Porter,* Burlingame, Calif. X-RAY ENERGY SPECTROMETER SYSTEM. Patent dated Nov. 11, 1975. Disclaimer filed Dec. 17, 1984, by the assignee, *Kevex Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,373,459.—*William H. Dunn,* Frankford Township, Sussex County; *Stephen A. Garron,* Elizabeth; *Leonard I. Horey,* West Orange; *John W. Wurst,* Chester Township, Morris County, all of N.J. ELECTRONICALLY CONTROLLED SEWING MACHINE ARRANGED TO SEW A SEQUENCE OF STITCH PATTERNS. Patent dated Feb. 15, 1983. Disclaimer filed Dec. 10, 1984, by the assignee, *The Singer Co.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,456,690.—*Michael Cais* and *Moshe Shimoni,* Haifa, Israel. NON-CENTRIFUGATION METHOD FOR IMMUNOASSAY OF MATERIALS. Patent dated June 26, 1984. Disclaimer filed Sept. 4, 1984, by the assignee, *Technion Research and Development Foundation Ltd.*

The term of this patent subsequent to June 12, 2001 has been disclaimed.

4,485,031.—*Franciszek Olstowski,* Freeport, and *Richard D. Peffley,* Lake Jackson, Tex. COMPATIBLE MIXTURES OF AMINATED POLYETHER POLYOLS AND LOW MOLECULAR WEIGHT GLYCOLS. Patent dated Nov. 27, 1984. Disclaimer filed Dec. 10, 1984, by the assignee, *The Dow Chemical Co.*

The term of this patent subsequent to Nov. 27, 2001 has been disclaimed.

4,486,434.—*George S. Sach,* Welwyn, England. HISTAMINE H_2-ANTAGONISTS. Patent dated Dec. 4, 1984. Disclaimer filed Dec. 17, 1984, by the assignee, *Smith Kline & French Laboratories Ltd.*

The term of this patent subsequent to Apr. 24, 2001 has been disclaimed.

Disclaimer and Dedication

3,378,276.—*George M. Fulmer,* Silver Spring, Md. HYDRAULICALLY OPERATED DEMOUNTABLE RUNNING GEAR WITH DIAGONAL RAMS. Patent dated Apr. 16, 1968. Disclaimer and Dedication filed Jan. 26, 1983, by the assignee, *The Union Corp.*

Hereby disclaims and dedicates to the Public the term subsequent to Apr. 16, 1985.

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California	Los Angeles Public Library	(213) 612-3273
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	Boston Public Library	(617) 536-5400 Ext. 265
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	New York Public Library (The Research Libraries)	(212) 930-0850
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	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Dallas Public Library	(214) 749-4176
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 19, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-25-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	5-02-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	8-01-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-12-80
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	1-12-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	5-03-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-01-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-13-80
DESIGN, GROUP 290—K. L. CAGE, Director	9-23-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-19-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-29-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	12-04-81

Expiration of patents: The patents within the range of numbers indicated below expire during January 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,360,800 to 3,366,969, inclusive

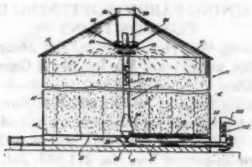
Plant Patents ..... Numbers 2,784 to 2,793 inclusive

REEXAMINATIONS

FEBRUARY 26, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,765,547 (306th)
APPARATUS FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN
Charles C. Shivvers, Corydon, Iowa
Reexamination Request No. 90/000,367, Apr. 27, 1983.
Reexamination Certificate for Patent No. 3,765,547, issued Oct. 16, 1973, Ser. No. 79,654, Oct. 9, 1970.
Division of Ser. No. 638,257, May 15, 1967, Pat. No. 3,563,399.
Int. Cl.[3] B65G *65/46;* B01F *15/02*
U.S. Cl. 366—131



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

1. Apparatus for circulating a free-flowing grain for drying purposes within a circular storage bin having a ventilated bottom wall comprising:

a. a sweep auger unenclosed over the full length thereof adapted to swing horizontally on said bottom wall about a vertical axis located centrally of said bin,

b. an upright auger rotatable about said vertical axis having a grain receiving inlet at the lower end thereof and a grain outlet at the upper end thereof for returning the grain into the bin, and

c. coacting means on said sweep auger and upright auger for moving material from the inner end of said sweep auger into said grain receiving inlet,

d. said sweep auger having a flighting and shaft relatively formed over the axial length of the auger such that, as the sweep auger is horizontally rotated, any given axially extended section of the auger has the capacity to move inwardly of the auger all of the grain picked up by that portion of the auger projected outwardly from said axially extended section plus the grain picked up by the axially extended section, whereby to remove a horizontal layer of grain of uniform thickness from the floor of the bin during each revolution of horizontal rotation thereof.

B1 4,219,204 (307th)
ANTI-EXTRUSION SEALS AND PACKINGS
Frederick B. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.
Reexamination Request No. 90/000,322, Feb. 3, 1983.
Reexamination Certificate for Patent No. 4,219,204, issued Aug. 26, 1980, Ser. No. 965,033, Nov. 30, 1978.
Int. Cl.[3] F16J *15/22, 15/32*
U.S. Cl. 277—188 A

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

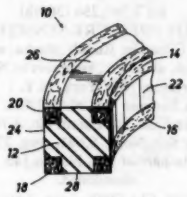
Claims **3, 11–13, 20, 28–30** and **44–46** are cancelled.

Claims **1, 18** and **35** are determined to be patentable as amended.

Claims **2, 4–10, 14–17, 19, 21–27, 31–34** and **36–43**, dependent on an amended claim, are determined to be patentable.

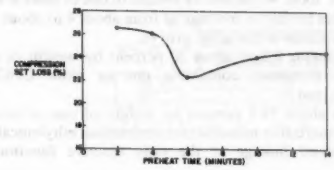
1. An anti-extrusion sealing device comprising:

a generally non-metallic body section, said body section having at least one sealing surface, and



an anti-extrusion section [contiguous] *bonded to* at least a portion of said body section, said anti-extrusion section serving to resist extrusion forces acting on said body section adjacent said anti-extrusion section, said anti-extrusion section being comprised of a knitted material *consisting of a continuous series of interlocking loops in tubular fashion, said knitted material being pre-formed into the desired volume and configuration prior to bonding to said body section*, at least some of the filaments of said knitted material being metallic in nature.

B1 4,305,796 (308th)
METHODS OF PREPARING POLYIMIDES AND ARTIFACTS COMPOSED THEREOF
John Gagliani; Raymond Lee, and Anthony L. Wilcoxson, all of San Diego, Calif., assignors to IML Corporation
Reexamination Request No. 90/000,589, Jul. 11, 1984.
Reexamination Certificate for Patent No. 4,305,796, issued Dec. 15, 1981, Ser. No. 186,629, Sep. 12, 1980.
Int. Cl.[3] C08G *18/14, 63/40*
U.S. Cl. 204—159.19



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–24** and **29–37** are cancelled.

Claim **25** is determined to be patentable as amended.

Claims **26–28**, dependent on an amended claim, are determined to be patentable.

New claim **38** is added and determined to be patentable.

25. A method of preparing a polyimide with a cellular structure which comprises the steps of: forming a primary diamine, 3,3',4,4'-benzophenone-tetracarboxylic acid ester solution by dissolving one or more diamines and the aforesaid acid or an anhydride thereof in a lower alkyl alcohol; atomizing said solution; drying the droplets obtained by atomizing the diamine, ester solution with a heated gas *in a chamber, the outlet temperature of the chamber being limited to a maximum of 80° C.* to form a dry, particulate, nonpolymeric precursor; and exposing said precursor to microwave radiation having a frequency of at least 915 [mHz] *MHz* for periods of sufficient duration to develop a cellular physical structure and to at least partially develop a polyimide chemical structure.

B1 3,769,254 (309th)

HIGH STRENGTH PRESSURE-SENSITIVE ADHESIVES

Carl C. Anderson, Gibsonia; Rudolf Maska, and Suryya K. Das, both of Pittsburgh, all of Pa., assignors to National Starch and Chemical Corporation, New York, N.Y.

Reexamination Request No. 90/000,483, Dec. 15, 1983.
Reexamination Certificate for Patent No. 3,769,254, issued Sep. 4, 1973, Ser. No. 175,691, Aug. 27, 1971.
Continuation-in-part of Ser. No. 26,145, Apr. 6, 1970, abandoned.
Int. Cl.[3] C08K *5/04, 5/07*
U.S. Cl. 524—398

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12, 25,** and **27** is confirmed.

Claim **22** is cancelled.

Claims **13** and **23** are determined to be patentable as amended.

Claims **14–21, 24, 26** and **28**, dependent on an amended claim, are determined to be patentable.

New claims **29–43** are added and determined to be patentable.

13. A pressure-sensitive adhesive composition which when dry forms a tacky adhesive of high cohesive strength, said composition comprising an adhesive polymer formed by the reaction of

(A) a normally tacky interpolymer of monomers consisting essentially of

(1) at least about 40 percent by weight of one or more alkyl acrylates having an average of from about 4 to about 10 carbon atoms in the alkyl groups,

(2) from about 0.2 to about 20 percent by weight of an acrylic monomer containing one or more COOH groups, and

(3) up to about 59.8 percent by weight of one or more copolymerizable monomers containing an ethylenically unsaturated linkage as the only reactive functional group, said copolymerizable monomers having no more than 25 carbon atoms in the molecule; and

(B) a *chelated* metal alkoxide having the formula $R_nT(OR_1)_z$ wherein T is a metal selected from the group consisting of Groups II, III, IV, and V of the Periodic Table, R is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms and aryl radicals of from 6 to 16 carbon atoms, R_1 is selected from the group consisting of aliphatic and substituted aliphatic radicals containing from 1 to 18 carbon atoms, n is an integer whose value is 0 or greater and z is an integer whose value is at least 2 wherein the sum of n+z is greater than 1 and is equal to the valence of the metal represented by T.

B1 4,062,647 (310th)

CLAY-CONTAINING FABRIC SOFTENING DETERGENT COMPOSITIONS

Thomas D. Storm, Waterloo, Belgium, and Joseph P. Nirschl, Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Reexamination Request No. 90/000,298, Nov. 26, 1982.
Reexamination Certificate for Patent No. 4,062,647, issued Dec. 13, 1977, Ser. No. 486,274, Jul. 8, 1974.
Continuation-in-part of Ser. No. 271,943, Jul. 14, 1972, abandoned.
Int. Cl.[3] C09K *3/16;* **C11D** *3/12, 3/14;* **D06M** *11/06*
U.S. Cl. 8—137

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 4,** and **8** are determined to be patentable as amended.

Claims **2, 3, 5–7, 9,** and **10**, dependent on an amended claim, are determined to be patentable.

New claim **11** is added and determined to be patentable.

1. A granular, built laundry detergent composition consisting essentially of:

(a) from about 5% to about 20% by weight of a water soluble non-soap synthetic detergent compound selected from the group consisting of anionic synthetic detergents, nonionic synthetic detergents, ampholytic synthetic detergents, [zwitterionics] *zwitterionic* synthetic detergents, and mixtures thereof;

(b) from about 10% to about 60% by weight of [an organic or inorganic] *a polyphosphate* detergent builder salt; and

(c) from about 1% to about [50%] 15% by weight of a smectite clay selected from the group consisting of sodium and calcium montmorillonites, sodium saponites, sodium hectorites, lithium and magnesium hectorites, lithium and magnesium saponites, and mixtures thereof, having a cation exchange capacity of at least about 60 meq/100 g.,

said composition providing a solution pH of from about 7 to about 12 when dissolved in water at a concentration of about 0.12% by weight.

REISSUES

FEBRUARY 26, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

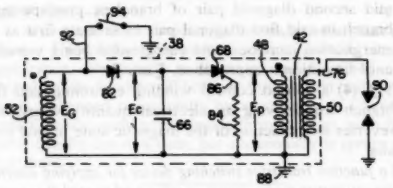
Re. 31,837
SINGLE CORE CONDENSER DISCHARGE IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Original No. 4,036,201, dated Jul. 19, 1977, Ser. No. 572,908, Apr. 29, 1975. Application for reissue Jun. 25, 1979, Ser. No. 51,983

Int. Cl.³ F02P *3/06, 3/08*

U.S. Cl. 123—601 **10 Claims**



1. A capacitor discharge system for an internal combustion engine comprising a permanent magnet means rotated about a circular path in synchronism with the operation of said engine, a core of ferromagnetic material mounted adjacent said circular path and having one portion providing a path for the varying flux generated by the movement of said magnet means past said core, a charging winding and a transformer core portion, said charging winding being offset from said primary and secondary windings radially with respect to said circular path; said charging winding and primary winding being wound on said one core portion such that the voltages induced therein by said varying flux each includes half wave voltages of opposite polarity, a charging circuit including a capacitor connected across said charging winding and a diode poled to pass half wave voltages of one polarity for charging said capacitor and maintaining said capacitor charged when the voltage generated in said charging winding is opposite said one polarity, circuit means connecting said capacitor with said primary winding for discharging said capacitor through said primary winding and including an electronic switch means having anode, cathode and control electrodes, the anodecathode junction of said switch means interconnecting the ends of said charging winding and said primary winding which are simultaneously at the same polarity, said control electrode being connected to the other end of said primary winding, the polarity of which is opposite said same polarity, said switch means being nonconductive during the charging of said capacitor by said one polarity of the voltage generated in said charging coil and being rendered conductive by voltage generated in the primary winding opposite said same polarity whereby said capacitor is charged during one complete half cycle of voltage generated in the charging coil and discharged during the next half wave voltage generated in said charging winding.

Re. 31,838
IRRIGATION APPARATUS

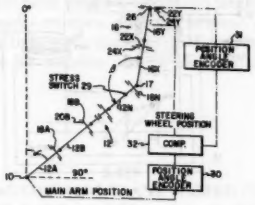
David Seckler, Fort Collins, Colo., and David Porat, Brookline, Mass., assignors to Valmont Industries, Inc., Valley, Nebr.

Original No. 3,802,627, dated Apr. 9, 1974, Ser. No. 306,545, Nov. 15, 1972. Application for reissue Sep. 19, 1980, Ser. No. 201,903

Int. Cl.³ A01G *25/09*

U.S. Cl. 239—177 R **39 Claims**

1. Irrigating apparatus for supplying water to a non-circular area, comprising a rotatable main arm assembly *mounted at one end to a fixed base pivot and rotatable thereabout* for supplying water to a first portion of said area, an extension arm assembly at the *other* end of said main arm assembly for supplying water to portions of said area outside of said first portion, *said extension arm assembly and main arm assembly each being supported on one or more support towers, with each assembly supporting a*



plurality of spaced irrigating sprinklers, said main arm assembly support towers having wheels and wheel driving means, means for moving said extension arm assembly with respect to said main arm assembly, and control means for operating said moving means to move said extension arm assembly relative to said main arm assembly to irrigate said portions outside of said first portion as said main arm rotates.

Re. 31,839
BOBBIN TRANSPORT APPARATUS AND METHOD

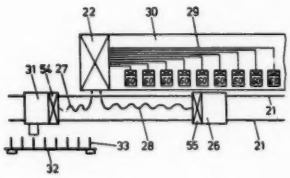
Heinz Schippers; Gerd Muennekehoff, both of Remscheid, and Udo Teich, Sprochhoevel, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Original No. 4,351,494, dated Sep. 28, 1982, Ser. No. 191,349, Sep. 26, 1980. Application for reissue Sep. 28, 1983, Ser. No. 536,898

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939675; Nov. 14, 1979, 2945861

Int. Cl.³ B65H *54/26*

U.S. Cl. 242—35.5 A **29 Claims**



18. A movable quality control measuring apparatus in combination with a textile yarn processing machine having a plurality of yarn winding stations aligned along at least one side thereof and with the winding stations each having a bobbin mounting means, said apparatus comprising

a movable carriage adapted for movement to a position adjacent each winding station,

means mounted on said carriage for receiving and supporting a bobbin, and

measuring means mounted on said carriage for determining at least one quality control related physical characteristic of a support bobbin.

Re. 31,840

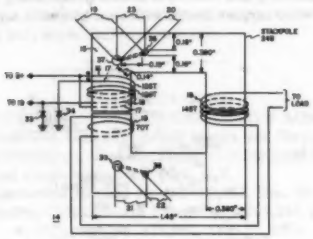
TRANSFORMER FOR USE IN A STATIC INVERTER

James E. Harris, Liverpool; Robert McFadyen, Syracuse; William Peil, North Syracuse, and Nicholas A. Schmidtz, Liverpool, all of N.Y., assignors to General Electric Co., Syracuse, N.Y.

Original No. 4,259,716, dated Mar. 31, 1981, Ser. No. 28,405, Apr. 9, 1979. Application for reissue Jul. 7, 1982, Ser. No. 396,171

Int. Cl.³ H01F *31/00*; H02M *1/08*

U.S. Cl. 363—97 10 Claims



10. In combination,

(1) a core of substantially linear magnetic material for main flux [persing] *persuing* a closed magnetic path, a pair of apertures in a localized region of the core, a first aperture being arranged before a second aperture along said magnetic path, said first aperture dividing the magnetic path into a first and second branch, and the second aperture dividing the magnetic path into a third and fourth branch, with a fifth branch being formed between said apertures, the first and fourth branches forming a first diagonal pair of branches and the second and third branches forming a second diagonal pair of branches,

(2) a primary winding encircling said magnetic core for generating a main flux in said closed magnetic path when an alternating voltage is applied thereto,

(3) a first control winding encircling said fifth branch for generating a circulating flux forming two counterrotating loops, one around each aperture, when an alternating current is supplied thereto, the flux in said two loops combining additively in said fifth branch,

[(4) means for energizing] said primary winding and said first control winding with alternating quantities having a *suitable* fixed relative phase [so that], *generating a combined flux in which* the flux in one of the loops combines *additively* with said main flux [additively] in each of said first diagonal pair of branches and subtractively in each of said second diagonal pair of branches, predisposing a branch in said first diagonal pair to saturate first as the energization increases, said energization being increased until saturation is approached, [and]

[(5)] (4) a second control winding encircling said fifth branch for deriving an electrical quantity whose sign reverses as a function of the magnetic state of said core, *and*

(5) a junction transistor switching device for applying alternating current to said primary winding and to said first control winding, said device exhibiting appreciable stored charge, and (6) means coupling said second control winding across the input junction of said transistor for applying a current to said switching device in a sense aiding normal conduction in the absence of saturation, and in a sense inhibiting conduction when saturation occurs.

PLANT PATENTS

GRANTED FEBRUARY 26, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,407

MINIATURE ROSE PLANT—PUCKER UP

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 22, 1983, Ser. No. 525,453

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Pucker Up' of hardy, dwarf, moderate growth, attractive appearance, substantially as illustrated and described, characterized by its blooms of brilliant Orient Red with velvety petals, enhanced occasionally by an overlay of Chrysanthemum Crimson, easy to propagate form cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

5,408

CHRYSANTHEMUM PLANT NAMED CHARDONNAY

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 16, 1983, Ser. No. 504,730

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Chardonnay, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform nine week flowering response; tall plant height when grown single stem; 85 to 110 mm. peduncles on open, normally terminal sprays; slow development of light green discs; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

5,409

CHRYSANTHEMUM PLANT NAMED CHAMP

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 16, 1983, Ser. No. 505,085

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., named Champ as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; golden yellow summer ray floret color; golden bronze winter ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform nine week flowering response; medium plant height and spreading branching pattern that adapts equally well to pinched disbud or spray pot mum programs.

PATENTS

GRANTED FEB. 26, 1985

ERRATA

For CLASS	See PATENT NO.
051–083	4,501,110
384–619	4,501,454
502–167	4,501,685
514–017	4,501,733
514–198	4,501,734
514–046	4,501,735
514–167	4,501,737
514–167	4,501,738
514–203	4,501,739
514–283	4,501,740
514–202	4,501,741
514–226	4,501,742
514–201	4,501,743
514–245	4,501,744
514–222	4,501,745
514–357	4,501,746
514–342	4,501,747
514–318	4,501,748
514–326	4,501,749
514-369	4,501,750
514–374	4,501,751
514–414	4,501,752
514–447	4,501,753
514–456	4,501,754
514–456	4,501,755
514–120	4,501,756
514–267	4,501,890
548–484	4,501,923
328–026	4,502,013
361–332	4,502,132

PATENTS

GRANTED FEB. 26, 1985

ERRATA

PATENTS

GRANTED FEBRUARY 26, 1985

GENERAL AND MECHANICAL

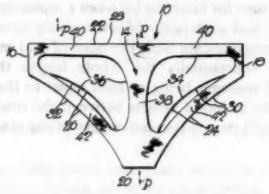
4,501,023
NECK SUPPORT
Johnny B. Bilberry, 133 Holcomb Dr., Shreveport, La. 71103
Filed Sep. 8, 1981, Ser. No. 299,653
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **6 Claims**

1. A neck support for use in cooperation with protective athletic equipment to protect an athlete from neck injury comprising:

(a) a generally elongated, yieldable collar shaped substantially into a circle around the athlete's neck, and collar laces extending from the ends of said collar for securing said ends together beneath the athlete's chin; and

(b) a pair of generally rectangular-shaped, relatively stiff, but yieldable front supports carried by said collar and extending downwardly from said collar beneath the athlete's chin and a plurality of apertures in spaced relationship in said front supports for securing said front supports to the protective athletic equipment.

4,501,024
BATHING TRUNKS
Peter J. Russo, 719 Nut Plains Rd., Guilford, Conn. 06437
Filed Dec. 5, 1983, Ser. No. 558,058
Int. Cl.³ A41D *5/00*
U.S. Cl. 2—67 **5 Claims**



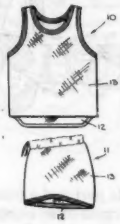
1. Bathing trunks having a median plane and superposed substantially triangular front and rear panels symmetrical about said plane and joined at the corners, with the adjacent sides of the panels between the joined corners being non-joined to form waist and leg openings, and said rear panel having two cut-outs symmetrical about said plane and leaving between them a first band-like panel part of a width to cover the cleavage between a wearer's buttocks, with said cut-outs exposing a wearer's buttocks.

4,501,025
COMPOSITE FABRIC FOR SPORTSWEAR
Lawrence Kuznetz, 66 Joyce Rd., Plainview, N.Y. 11803
Filed Jul. 28, 1983, Ser. No. 518,133
Int. Cl.³ H41D *27/08*
U.S. Cl. 2—243 A **7 Claims**

1. An article of sportswear fabricated of a composite fabric which when worn by an athlete undergoing strenuous physical activity, functions to regulate the factors causing perspiration and evaporative cooling in a manner conducive to optimum performance; said fabric comprising:

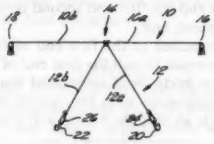
A a porous open weave hydrophobic inner fabric inner layer in contact with the skin of the wearer and formed on non-absorbing black-hued fibers which act to absorb infrared energy emitted by the wearer and to transmit perspiration away from the skin;

B a porous open weave hydrophilic outer fabric layer joined to the inner layer and exposed to the atmosphere to receive the transmitted perspiration from the inner layer, said outer layer being formed of absorbent fibers having good wicking properties which act to absorb the transmitted perspiration and to disperse it throughout the exposed surface of the outer layer to promote evaporative cooling at a controlled rate; and



C a metallic coating formed on the exposed surface of the outer layer to reflect ultraviolet radiation impinging thereon.

4,501,026
BELT-LIKE ORNAMENTAL MEMBER
Joseph T. Seneca, 401-Rte. 22 Regency Village, North Plainfield, N.J. 07060
Filed Aug. 15, 1983, Ser. No. 522,807
Int. Cl.³ A41C *19/22*
U.S. Cl. 2—308 **18 Claims**

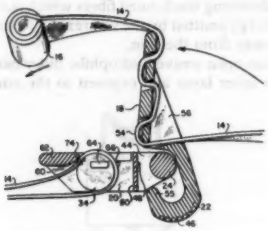


1. An ornamental member for use over a garment such as pants having a waistband and leg portions, the member comprising a first portion, a second portion, and means for connecting said second portion to said first portion, said first portion comprising first and second parts adapted to extend in opposite directions from the rear of the waistband to the front thereof to encircle the garment, said first and second parts being joined together, proximate the front of the waistband with the free ends thereof extending downwardly along the front of the garment, said second portion being adapted to extend downwardly along the rear of the garment from said connecting means, between the leg portions and upwardly along the front thereof, the second portion comprising third and fourth parts adapted to be connected at spaced locations proximate the front of the waistband at either side of the point where said first and second parts are joined.

4,501,027
QUICK RELEASE WEIGHT BELT AND BUCKLE THEREFOR

Mark S. Olsson, 4968 Diane Pl., San Diego, Calif. 92117

Filed Sep. 27, 1982, Ser. No. 423,630
Int. Cl.³ A41F 9/00
U.S. Cl. 2—321 20 Claims



1. A belt comprising:

a buckle having a male part and a female part;

the male part being formed of an elongate first body having a transversely extending hook formed at a forward end thereof and at least one transversely extending slot formed in the remaining portion of the first body;

the female part being formed of a second elongate body having a transversely extending post at a forward end thereof and a transversely extending cavity separating the post from the remaining portion of the second body, the hook, post and cavity being dimensioned and configured so that the hook can be inserted into the cavity to engage and surround the post when the first and second bodies extend at an angle relative to one another and so that the bodies can thereafter be rotated so that they are in substantial longitudinal alignment, the remaining portion of the second body having at least one transversely extending slot;

an elongate piece of webbing having a first end threaded through the slot in the first body and a second end threaded through the slot in the second body, the length of the webbing being sufficient so that the portion extending between the male and female parts of the buckle can encircle a person's waist when the hook is in engagement with the post and the first and second bodies are in longitudinal alignment; and

handle means attached to the first end of the webbing for permitting a person to pull the first end of the webbing to rotate the first body from substantial longitudinal alignment and engagement with the second body through a sufficient angle so that the bodies will disengage.

4,501,028
LIGHTWEIGHT REFLECTIVE BELT

George T. Gottschall, 2020 E. 22nd St., Fremont, Nebr. 68025

Filed May 25, 1983, Ser. No. 497,861
Int. Cl.³ A41F 3/02
U.S. Cl. 2—338 8 Claims

1. A lightweight reflective belt, comprising,

an elongated belt member having opposite ends and inner and outer layers of a thin supple material,

a center layer of a soft spongy material, and

means for securing said inner, outer and center layers together whereby said center layer imparts body to the layered belt member,

said means for securing said inner, outer and central layers together comprising multiple spaced-apart lengths of stitching for a quilted effect,

coacting fastener means on the opposite ends of the belt member and operative for length adjustably securing said opposite ends together,

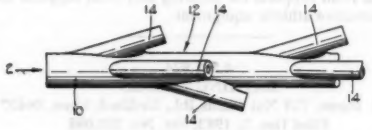
said outer layer having a bright reflective surface over substantially the entire outer layer whereby, upon securement

of the opposite ends so that the belt member loosely rests on a wearer's hips, the visibility of the wearer is increased.

4,501,029
TENDON REPAIR

Derek J. W. McMinn, 26 Chesterwood Rd., Kings Heath, Birmingham 13, England

Filed Apr. 13, 1983, Ser. No. 484,606
Claims priority, application United Kingdom, Apr. 22, 1982, 8211608
Int. Cl.³ A61F 1/24, 1/00; A61B 17/04
U.S. Cl. 3—1 7 Claims



1. A device for assisting in repair of a severed tendon, comprising a main tube for insertion between a replacement tendon and its sheath, and a plurality of transversely extending passages which communicate with the bore of said main tube at intervals over substantially the whole length thereof, the lengths of said passages being at least equal to the minimum required lengths of blood vessels between the tendon and its sheath which will permit free movement of the tendon within the sheath.

4,501,030
METHOD OF LEAFLET ATTACHMENT FOR PROSTHETIC HEART VALVES

Ernest Lane, Huntington Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 17, 1981, Ser. No. 293,667
Int. Cl.³ A61F 1/00
U.S. Cl. 3—1.5 30 Claims

1. A prosthetic heart valve subject to a force when in use comprising:

means defining a plurality of valve leaflets;

means for mounting said valve leaflets for opening and closing movement and in a configuration suitable for a prosthetic heart valve; and

said mounting means including first means for attaching at least one of the valve leaflets to said mounting means and second means including first and second members responsive to the force on the valve when the valve is in use for

clamping a region of said one valve leaflet between said first and second members to augment the attachment

provided by said first means and reduce the stress on said first means.

4,501,031

METAL AND PLASTIC COMPOSITE TIBIAL COMPONENT FOR KNEE JOINT

John M. McDaniel, Warsaw, and Clayton R. Miller, Bremen, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Jan. 22, 1981, Ser. No. 227,329
Int. Cl.³ A61F *1/03*
U.S. Cl. 3—1.911 **6 Claims**

1. A load bearing tibial component of a knee prosthesis comprising:

(a) a supporting metal base plate which is comprised of a lower plate surface, an upper plate surface, and a peripheral edge, the peripheral edge including a plurality of notches spaced apart from each other around the peripheral edge, and;

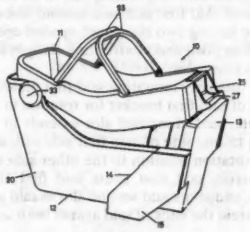
(b) a plastic bearing portion which is integrally molded onto the upper surface of the supporting metal base plate, such that the plastic completely covers the upper surface of the metal base to form a desired bearing surface, and wherein the plastic flows through and fills the notches and completely surrounds the peripheral edge to form a thickness of plastic which extends beyond the peripheral edge of the metal base plate, and forming a lower plastic rim surface wherein the area of said lower plastic rim surface is no greater than 15% of the area of the lower surface of the metal base, said lower plastic rim surface being flush with the perimeter of the lower surface of the metal base plate, creating a metal/plastic seam, and wherein the area of the plastic rim is substantially less than the area of the lower metal plate surface, and wherein a secure mechanical interlock is created between the metal plate and plastic portion.

4,501,032

CHILD RESTRAINT BASSINET

Robert B. Heath, and Colin M. Nagel, both of Adelaide, Australia, assignors to Rainsfords Metal Products Pty. Ltd., Lonsdale, Australia

Filed Aug. 11, 1982, Ser. No. 407,043
Claims priority, application Australia, Aug. 20, 1981, PF0346
Int. Cl.³ A47D *7/04*
U.S. Cl. 5—94 **14 Claims**



1. A bassinet assembly comprising two sub-assemblies, one incorporating a support base and the other incorporating a bassinet, and a hinge operatively coupling a forward end of the bassinet sub-assembly near its upper edge to a corresponding end of the support base for movement relative thereto,

one of said sub-assemblies comprising a trigger latch near its rear end, said trigger latch comprising a latch surface which abuts a complementary surface on the other said sub-assembly and thereby restrains the bassinet, but said trigger latch being of such weight that, upon being subjected to an acceleration force exceeding a threshold level being applied to the assembly in a rearward direction, the trigger latch moves to disengage from abutment with said complementary surface and allows downward and forward hinging movement of the bassinet sub-assembly with respect to the support base, said hinging movement being arrested by engagement of the surfaces of the bassinet against surfaces of the base,

one of said sub-assemblies also comprising a finger latch having a surface which releasably engages a surface of the other said sub-assembly and releasably retains the bassinet sub-assembly from upward and rearward movement with respect to the base sub-assembly.

4,501,033

BED FRAME HAVING SWIVEL BRACKET FOR HEADBOARD MOUNTING

Jason H. Kessel, and Henry Alperin, both of Sharon, Mass., assignors to West End and Hub Spring Company, Stoughton, Mass.

Filed May 23, 1983, Ser. No. 497,005
Int. Cl.³ A47C *19/00*; F16C *11/00*
U.S. Cl. 5—200 R **20 Claims**

9. Apparatus providing a wide range of lateral adjustment for mounting a headboard to a bed frame, comprising:

first and second side rails for supporting a bed;

first and second plates each having at least one aperture for mounting a headboard;

first means for mounting said first plate to said first side rail for rotation in the plane of the first plate between a first position where said at least one aperture is to one side of said first side rail, and a second position, where said at least one aperture is to the other side of said first side rail; and

second means for mounting said second plate to said second side rail for rotation in the plane of the second plate between a first position, where said at least one aperture is to one side of said second side rail, and a second position,

where said at least one aperture is to the other side of said second side rail.

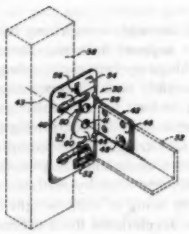
18. A bed frame operable to mount headboards of varying lateral dimensions, comprising:

a first side rail;

a first bracket having an arm and an apertured flange at a right angle thereto, said apertured flange is fastened to an end of said side rail, and said arm has first and second slots respectively intermediate a corresponding one of its ends and its center, and third and fourth slots respectively intermediate a corresponding one of its ends and a respective one of said first and said second slots;

a first plate having two elongated, spaced-apart apertures, an upstanding post, and confronting flanges each defining an arm-receiving slot;

means for rotatably mounting said first plate eccentrically to the arm of said first bracket for rotation in the plane of the first plate, said elongated slot extends in a first rotation position to one side of said first side rail, and extends in a second rotation position to the other side of said side rail, and wherein said post abuts said first slot in said first position, and abuts said second slot in said second position, and wherein the ends of said arm in both said first and said



second rotation positions is received and captured by corresponding ones of said arm-receiving slots;

a second side rail;

a second bracket having an arm and an apertured flange at a right angle thereto, said apertured flange is fastened to an end of said side rail, and said arm has first and second slots respectively intermediate a corresponding one of its ends and its center point, and third and fourth slots respectively intermediate a corresponding one of its ends, and a respective one of said first and second slots;

a second plate having two elongated apertures, an upstanding post, and confronting flanges, each defining an arm-receiving slot; and

means for rotatably mounting said second plate eccentrically to said second bracket for rotation in the plane of the second plate, said elongated slots extend in a first rotation position to one side of said second side rail, and extends in a second rotation position to the other side of said second side rail, and wherein said post abuts said first slot in said first position and abuts said second slot in said second position, with the ends of said arms being captured, and received in corresponding ones of said arm-receiving slots.

4,501,034

INFLATABLE PILLOW

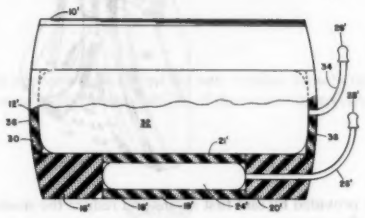
Monte H. Greenawalt, 45 McClellan Blvd., Davenport, Iowa 52803

Filed Oct. 27, 1983, Ser. No. 546,248

Int. Cl.³ A47G 9/00

U.S. Cl. 5—441 **3 Claims**

1. A pillow of the class described, comprising first and second, elongated side-by-side elements substantially coextensive in length and adhered together to present a composite body having upper and lower surfaces, the first element upper surface being adapted to receive the neck of a reclining person and the upper surface of the second element being adapted to receive the head of such reclining person, said first element including first and second end-to-end sections, said first section being made up of relatively dense yieldable material of preselected firmness substantially throughout its length, said second section including a compartment therein exclusive of the first section, an air bladder contained within said compartment and selectively inflatable to vary the firmness of the upper surface of the second section relative to the firmness of the first section, said second element including a compartment with a



second air bladder being selectably inflatable to vary the firmness of the second element, and said second element being inflated as to possess, throughout its length, less firmness than the first section and less firmness than the second section when the bladder is inflated to a degree equal to or exceeding the firmness of the first section, said pillow including a third element flanking and adhered to the second element at the side thereof opposite to the first element, said third element being so constructed as to possess substantially the firmness of the first section of the first element.

4,501,035

SELF-SEALING WATERBED MATTRESS

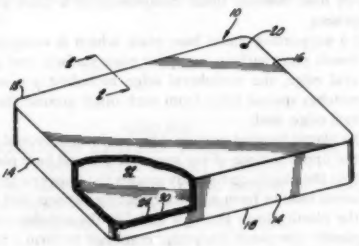
Charles P. Hall, Muir Beach, and Joseph Philipson, Pasadena, both of Calif., assignors to Monterey Manufacturing Co., Carson, Calif.

Continuation of Ser. No. 134,628, Mar. 27, 1980, Pat. No. 4,382,305. This application Sep. 22, 1982, Ser. No. 421,369

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ A47C 27/08

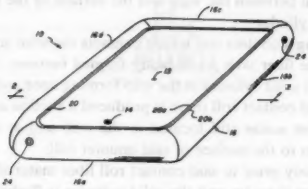
U.S. Cl. 5—451 **4 Claims**



1. A self-sealing waterbed mattress comprising a polymeric, flexible, puncturable envelope and a flexible internal liner separated from the envelope by a layer of viscous, water-resistant, sealing material for sealing leaks in the envelope, the sealing material at 110° F. not being capable of flowing through a puncture in the envelope and at 60° F. being capable of flowing into a puncture in the envelope and sealing the envelope against water leaks through the puncture, the layer of the sealing material being less than about 50 mils thick, wherein

when water is in the mattress the water is within the internal liner.

4,501,036
FLOATATION SLEEP SYSTEM
Philip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625
Filed Dec. 15, 1982, Ser. No. 450,023
Int. Cl.³ A47C *27/10*
U.S. Cl. 5—452 **7 Claims**



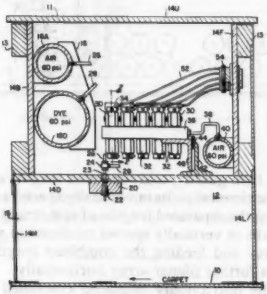
1. An improved floatation system, for supporting a human body, comprising:
- a first chamber formed of flexible, dimensionally stable, fluid impervious material and adaptd to contain a fluid;
- a second chamber formed of flexible, dimensionally stable, fluid impervious material and adapted to contain pressurized air, said second chamber surrounding the marginal perimeter of said first chamber for supporting such first chamber;
- means, adjacent to said first chamber and extending through said second chamber, for dividing said second chamber into independent cells; and
- a plurality of valves, associated with said independent cells respectively, adapted to enable said cells to be independently pressurized.

4,501,037
METHOD FOR INTRODUCING HEAT-SENSITIVE MATERIAL INTO A HOT ENVIRONMENT
Khin M. Lay, Gardena; Stephen E. Palguta, Redondo Beach; Ramon B. Fernandez, Torrance, and Santiago C. Cabalquinto, Lawndale, all of Calif., assignors to Hitco, Newport Beach, Calif.
Filed Apr. 11, 1983, Ser. No. 483,922
Int. Cl.³ D06B *3/12, 23/04*
U.S. Cl. 8—149.2 **11 Claims**

FEED HEAT-RESISTANT LEADER INTO OXIDIZING OVENS (HOT OR COLD)
HEAT UP OXIDIZING OVENS IF COLD
SPLICE LEADING EDGE OF WEB OF TOWS TO TRAILING EDGE OF LEADER
CONTINUE FEEDING LEADER AND THEN WEB OF TOWS INTO AND THROUGH OXIDIZING OVEN
SEPERATE LEADING EDGE OF WEB OF TOWS FROM TRAILING EDGE OF LEADER

1. A method of introducing an elongated web of heat-sensitive material into an oven under tension in an arrangement in which the elongated web is generally continuously fed into and through a complex path within the oven comprising the steps of:
- feeding a leader in the form of an elongated web of heat-resistant material through at least a substantial portion of the complex path within the oven so that a trailing edge thereof remains outside of the oven and a nominal amount of tension is established in the leader;
- providing an elongated web of heat-sensitive material adjacent the oven, the web of heat-sensitive material having a leading edge;
- splicing the trailing edge of the leader to the leading edge of the web of heat-sensitive material; and
- continuing to feed the leader and then the web of heat-sensitive material into and through the oven.

4,501,038
METHOD AND APPARATUS FOR SPRAY TREATING TEXTILE MATERIAL
Billy J. Otting, Lafayette, Ga., assignor to Otting International, Inc., Lafayette, Ga.
Filed Jun. 23, 1982, Ser. No. 391,468
Int. Cl.³ D06B *1/02*
U.S. Cl. 8—151 **33 Claims**



1. A method of treating a continuously moving textile web comprising the steps of:
- (a) conveying the web past at least one treating station,
- (b) mixing gas and treating liquid in a plurality of separate mixing chambers disposed at said at least one treating station, and
- (c) spraying the mixed gas and treating liquid onto the web through a plurality of spray nozzles, each spray nozzle communicating with a corresponding one of said mixing chambers.

14. Apparatus for treating a continuously moving textile web comprising:
- (a) a plurality of gas valves,
- (b) a plurality of liquid valves, each liquid valve corresponding on a one-to-one basis with one of said gas valves,
- (c) a plurality of mixing chambers, each mixing chamber connected to a corresponding one of said gas valves and a corresponding one of said liquid valves for receiving gas and liquid respectively and for mixing gas and liquid,
- (d) a plurality of spray nozzles for receiving mixed gas and liquid from a corresponding one of said mixing chambers and for spraying mixed gas and liquid towards said textile web, and
- (e) control means for selectively controlling said gas valves and said liquid valves to control the pattern of spray out of said spray nozzles.

4,501,039
SHEET-DYEING METHOD AND APPARATUS
Eckhard Godau, Via Crespera 50, CH-6932 Breganzone, Switzerland
Division of Ser. No. 218,817, Dec. 22, 1980, Pat. No. 4,416,124. This application Jul. 15, 1983, Ser. No. 514,308
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2951695; Dec. 4, 1980, 3045646; Dec. 4, 1980, 3045647
Int. Cl.³ D06B *23/00*
U.S. Cl. 8—151.2 **1 Claim**

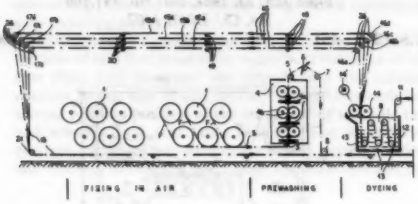
1. A method of dyeing a strand which comprises the steps of:
- (a) passing said strand consisting of a plurality of parallel

filaments along a first linear horizontal path portion and then into a dyeing bath at the end of said first horizontal path portion;

(b) within said bath passing a multiplicity of lengths of said strand jointly back and forth in contact with said bath until said lengths jointly emerge from said bath in a planar array formed by plied strands;

(c) squeezing said planar array of plied strands upon its emergence from said bath between a pair of rollers;

(d) subjecting the lengths of said strand upon their emergence from said rollers to a separation from their common



plane and then guiding said separated lengths along parallel linear horizontal paths in vertically spaced relationship;

(e) combining the separated lengths of said strand at the ends of said paths in vertically spaced relationship again into a planar array and feeding the combined lengths of plied strand in a further planar array horizontally;

(f) joining the horizontally displaced combined lengths of the last mentioned array with the strand along said first horizontal path portion for passage therewith into said bath; and

(g) treating the strand along the vertically spaced horizontal paths with a gas.

4,501,040

METHOD AND APPARATUS FOR WASHING STOCK SUSPENSIONS BY REMOVING UNDESIRED MATERIAL THROUGH AN ENDLESS WIRE

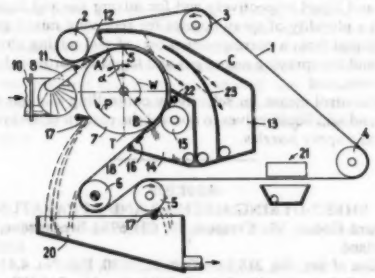
Mario Biondetti, Schio, Italy, and Roland Baur, Weingarten, Switzerland, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Continuation of Ser. No. 226,200, Jan. 19, 1981, abandoned. This application Aug. 5, 1982, Ser. No. 405,525

Claims priority, application Switzerland, Feb. 6, 1980, 931/80

Int. Cl.³ D21C 9/06

U.S. Cl. 8—156 **13 Claims**



1. A method of washing a stock suspension for removing therefrom undesired materials, comprising the steps of:

inteeding a stock suspension from which undesired materials are to be removed between a rotatable solid cylinder and an endless revolving wire;

tensioning the wire against the surface of the rotatable solid cylinder throughout a major part of a web forming zone located between a run-on location and a run-off location of the wire at the solid cylinder;

exerting pressure on the stock suspension between the wire and the surfce or the rotatable solid cylinder by means of the tensioned wire in order to outwardly express through the wire undesired materials contained in the stock suspension while forming a fibrous web from the stock suspension between the wire and the surface of the rotatable solid cylinder;

employing a contact roll which contacts the wire and dewaters the fiber web while being formed between the wire and the solid cylinder in the web forming zone and following said contact roll there is produced a suction action, so that free water still located in the web and at the wire adheres to the surface of said counter roll;

immediately prior to said contact roll fiber material located between the wire and the solid cylinder is flushed with a water jet to loosen said fiber material;

outfeeding the web from between the solid cylinder and the wire at said run-off location of the wire from the solid cylinder; and

disintegrating the web formed from the stock suspension between the rotatable slid cylinder and the wire upon departure of the web from between the rotatable solid cylinder and the wire.

6. A wire machine for washing a stock suspension to remove therefrom undesired materials, comprising:

a rotatable solid cylinder;

an endless revoling wire band to which there is infed the material which is to be filtered in the form of a suspension in a liquid and constituting a stock suspension;

said wire band being trained about a portion of the circumference of the rotatable solid cylinder;

an infeed device for forming a flat jet of the stock suspension;

said wire band and rotatable solid cylinder coacting with one another such that there is formed between the rotatable solid cylinder and the wire band travelling onto the rotatable solid cylinder and substantially wedge-shaped intermediate space;

said flat jet being directed towards said wedge-shaped intermediate space;

means for tensioning said wire band against at least a major part of said circumferential portion of said rotatable solid cylinder about which there is trained said wire band to form between said wire band and said rotatable solid cylinder a web forming zone;

means for removing solid constituents of the stock suspension adhering to the rotatable solid cylinder and the wire band and for disintegrating any web formed from the stock suspension between the rotatable solid cylinder and the wire band in said web forming zone;

a catch container operatively associated with said rotatable solid cylinder;

said catch container being provided with at least two chambers which are repsectively operatively associated with different portions of an angle of wrap of the wire band at the rotatable solid clinder;

said catch container is provided with a perforated partition wall which is previous to water and dividing said catch container into said at least two chambers;

said perforated partition wall being dimensioned so as to separate solid materials from water; and

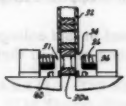
separate discharge means located to each side of said perforated partition wall.

4,501,041

PROCESS OF FORMING FRICTION

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed May 31, 1983, Ser. No. 499,260
Int. Cl.³ B21D *53/24*; B21K *1/64*
U.S. Cl. 10—86 A **9 Claims**



1. The method of making friction nuts which have their internal thread groove convolutions substantially filled from end to end except for substantially less than a full convolution at at least one end thereof which comprises substantially filling the thread groove convolutions in the nuts from end to end with fluid slurry consisting of thermoplastic resin particles and a liquid carrier while leaving the opening through the nut radially inwardly of the thread crests substantially clear, drying the slurry to leave within the thread grooves a form-sustaining deposit consisting of a coherent mass of resin particles, threadedly engaging a tool having a threaded end conforming substantially to the end of the mating member with which the nut is to be used with each nut, thereafter effecting a controlled relative rotation and advance between the nut and tool of equivalent to substantially less than a full turn of threaded engagement to displace friction material from the end of the thread groove convolution in the nut to shape the deposit to provide for substantially free initial engagement between the nuts and their mating part.

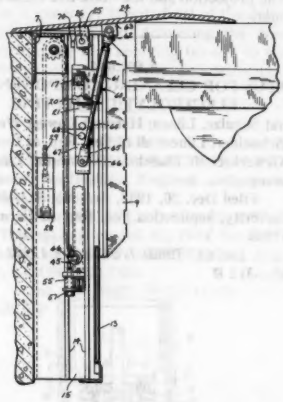
4,501,042

FRONT-OF-DOCK DOCKBOARD

Mark A. DiFonzo, Brookfield, Wis., assignor to Kelley Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 110,124, Jan. 7, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,499
Int. Cl.³ B65G *69/28*
U.S. Cl. 14—71.3 **12 Claims**

1. A dockboard to be mounted on a loading dock having an upper surface and a front wall, comprising a generally rectangular frame disposed adjacent the front wall of the dock, guide means for mounting the frame for vertical movement relative to the dock, a pair of elongated tubular guideways disposed on said frame adjacent the sides thereof, a guide bar mounted for sliding vertical movement within each guideway, and a deck plate pivotally connected to the upper ends of the guide bars, said deck plate being liftable vertically from a first vertical lower storage position in which the deck plate is disposed generally vertically along the front wall of the dock to a second higher vertical position where at the lower end of the deck plate is above a bed of a carrier disposed adjacent the front wall of the dock so that the deck plate can be pivoted about said guide bars to a generally horizontal position and lowered to a cross traffic position to span the distance between the dock and the bed of said carrier with the rear end of the deck plate supported on the dock and thr forward end of the deck plate supported on the carrier, the forward end of the deck plate being biased downwardly so that the deck plate will assume a generally vertical position when the carrier is removed from its location adjacent the front wall of the dock and said deck plate will descend by gravity to said storage position, the sliding



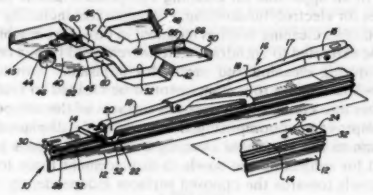
connection of the guide bars to said frame permitting the deck plate to tilt as a load passs over the deck plate when in the cross traffic position.

4,501,043

RETAINER CLIP FOR WINDSHIELD WIPER BLADE ASSEMBLIES

John J. Plisky, Munster, Ind., assignor to The Anderson Company of Indiana, Michigan City, Ind.

Filed Nov. 22, 1983, Ser. No. 554,249
Int. Cl.³ B60S *1/02*
U.S. Cl. 15—250.42 **10 Claims**



1. In a windshield wiper structure including an elongated squeegee, an elongated flexor mounting said squeegee and having a top surface opposite said squeegee and opposed side surfaces, said top surface including a plurality of apertures and said side surfaces each including at least one longitudinal groove, a claw retaining clip comprising a relatively rigid base having a locking post extending from one side thereof for entry into a selected one of said apertures, a pair of relatively resilient spaced fingers extending in generally parallel relation from said base and each terminating in hook-like elements directed toward the other one of said fingers and displaced from the plane of said base and spaced from each other such that when said base is in substantial abutment with said top surface, said hook-like elements will be received in a corresponding one of said grooves in the adjacent one of said side surfaces, the ends of said fingers remote from said base each having a cam surface, which when engaged by a claw, will allow the claw to cam said fingers and said hook-like elements apart as the claw moves toward said base, each of said fingers having a claw receiving recess intermediate its ends, opposed walls of each said recess being configured to capture a claw and restrain movement of the claw toward or away from said base in the

direction of elongation of said squeegee and said flexor, and two facing projections, one on each finger intermediate its ends and displaced from the plane of said base so as to enter the groove on the adjacent side surface, said recesses being located between the projection and the hook-like element on the associated finger.

4,501,044

APPARATUS FOR CLEANING COMPONENTS USED IN ELECTROLYTIC SMELTING

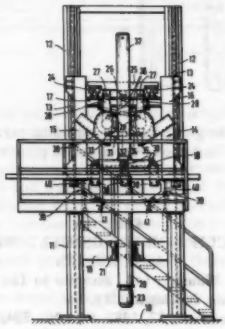
Hans-Horst Schulze, Lünen; Heribert Loweg, Werne, and Karl-Heinz Schneider, Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,485

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247368

Int. Cl.³ B08B *1/04*; A46B *13/02*

U.S. Cl. 15—312 R **14 Claims**



1. In an apparatus for cleaning components usable in electrodes for electrolytic smelting; said apparatus including a pair of rotatable cleaning brushes mounted in cowls from which air can be extracted to withdraw material removed from a component during cleaning and means for adjustably moving the brushes in relation to a component to be cleaned to bring the brushes into contact with opposed surfaces of the component; the improvement comprising the cowls being displaceable in relation to the associated cleaning brushes and means is provided for subjecting the cowls to displacement force to urge the cowls towards the opposed surfaces independently of the brushes.

4,501,045

SELF-LOCKING HINGE

Jack C. Boyer, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 5, 1983, Ser. No. 491,693

Int. Cl.³ E05D *11/10*

U.S. Cl. 16—331 **2 Claims**

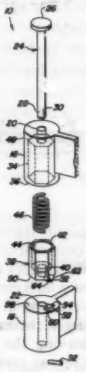
1. A self-locking hinge comprising:

(a) a first cylindrical hinge member having a multi-sided socket formed therein and an axial bore formed therethrough;

(b) a second cylindrical hinge member equal in diameter to said first hinge member having an axial bore formed therethrough and having a notch formed in an end thereof which extends radially from said bore, the outer end surface of said notch being spaced apart from the outer periphery of said second hinge member;

(c) a detent having an exterior surface sized and shaped to engage with the interior surface of said socket in a plurality of angular positions of said detent and which contains an axial bore formed therethrough, said detent having a tooth formed on an end thereof which is designed to engage with said notch, said tooth and notch being shaped to permit rotation of said first hinge member relative to said second hinge member in one direction while preventing relative rotation in an opposite direction, the extent of rotation being contingent on the angular displacement of said tooth from said notch as determined by the angular position at which said detent is inserted into said socket, said detent further having an enlarged bore formed in an end thereof which is opposite to said end which contains said tooth;

(d) a spring positioned in said enlarged bore formed in said detent and extending outward therefrom for biasing said



detent towards said second hinge member to facilitate engagement of said tooth into said notch upon rotation of said first hinge member relative to said second hinge member;

(e) a pivot pin extending through said axial bore formed in said first and second hinge members and said detent for pivotally joining said members together, said pivot pin having an enlarged first end which contacts an upper surface of said first hinge member and a second end which extends beyond a bottom surface of said second hinge member; and

(f) means cooperating with said second end of said pivot pin for axially retaining said detent and said second hinge members in abutting contact.

4,501,046

METHOD AND APPARATUS FOR PRODUCING SYNTHETIC MULTIFILAMENT YARN

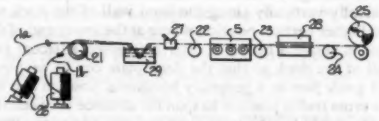
Eberhard Krenzer, Ennepetal-Rüggeberg, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,846

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113017; Apr. 24, 1981, 3116304; Jul. 4, 1981, 3126519; Oct. 17, 1981, 3141343

Int. Cl.³ D01G *1/08*

U.S. Cl. 19—0.35 **38 Claims**



1. A method of producing a synthetic yarn having certain physical characteristics, such as appearance, bulk, and hand,

which are normally associated with those of conventional yarn formed of staple fibers, and comprising the steps of

advancing a continuous multifilament yarn having loops, coils, bows and the like formed in the filaments thereof along a path of travel, while

enlarging at least some of the loops, coils, bows and the like in the advancing yarn by guiding the advancing yarn onto and around at least one rotating roller such that the portion of the yarn running onto the roller contacts the portion of the yarn leaving the roller and clampingly engages the projecting loops, coils, bows and the like of the leaving yarn portion.

4,501,047

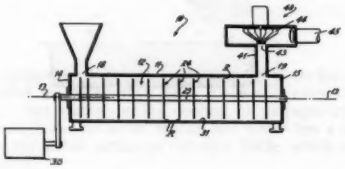
METHOD AND APPARATUS FOR SEPARATING FIBERS

William H. Wrassman, 5710 Shadyhollow Ln., Cincinnati, Ohio 45230

Filed Jan. 13, 1983, Ser. No. 457,769

Int. Cl.³ D01G *9/04, 13/00*

U.S. Cl. 19—85 **15 Claims**



12. Apparatus for separating fibers of fibrous agglomerates such as asbestos, aramid polymers, carbon fibers, Mylar fibers, and nylon fibers, comprising,

a housing presenting a cylindrical processing chamber,

a shaft rotatable in said chamber, the shaft having a series of radial blades mounted to it along its length, the blades presenting picklike pointed tips, the chamber presenting a narrow annular space outwardly of the tips,

means for rotating the shaft to provide a blade tip speed of at least 5000 feet per minute,

an inlet adjacent one end of said chamber,

an outlet adjacent a second end of said chamber, and

means providing an airstream from said inlet to said outlet through the chamber, the air stream being of sufficient velocity to carry fibers but not agglomerates to said outlet.

4,501,048

METHOD AND APPARATUS FOR FORMING A SLIVER

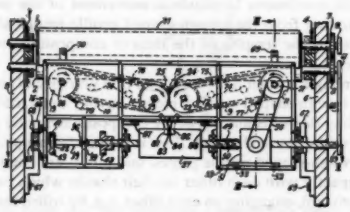
John M. Varga, Halifax, England, assignor to Carding Specialists (Canada) Ltd., Toronto, Canada

Filed Sep. 23, 1982, Ser. No. 422,095

Claims priority, application United Kingdom, Sep. 24, 1981, 8128884

Int. Cl.³ D01G *15/46*; D01H *5/72*

U.S. Cl. 19—106 R **24 Claims**



1. A method for forming a sliver from a web of fibres leaving the upper part of a horizontally extending delivery roller of a cotton type carding engine, the method comprising delivering the web downwardly from the upper part of the delivery roller into proximity with a surface of power driven selvedge support means, moving the surface of the selvedge support means at a level wholly below the uppermost part of the delivery roller in a direction that is generally longitudinal of the delivery roller and into a sliver-forming nip, delivering the downwardly-travelling web into the nip, applying tension to the web between the delivery roller and the nip, and delivering the sliver from the nip.

4,501,049

DISPOSABLE ONE-PIECE SECURITY SEALING DEVICE

Donald Adamson, Warlingham, England, assignor to Envopak Limited, Kent, England

Continuation of Ser. No. 411,217, Aug. 25, 1982, Pat. No. 4,470,173. This application Jul. 12, 1984, Ser. No. 630,162

Claims priority, application United Kingdom, Aug. 27, 1981, 8126121; Apr. 20, 1982, 8211382

Int. Cl.³ B65D *77/10, 33/34*

U.S. Cl. 24—30.5 P **5 Claims**

1. A disposable one-piece security sealing device for enclosing an article which includes a strap of flexible material having an enclosure at one end thereof with a passage formed therein for engaging the other end of said strap whereby said other end of said strap is irremovably insertable to an adjustable extent comprising a tab formed as an extension of said strap around and beyond said enclosure, and a line of weakness which extends around said enclosure and terminates in a side edge of said strap whereby tearing along said line of weakness the end of the strap having said tab is separated from said enclosure.

4,501,050

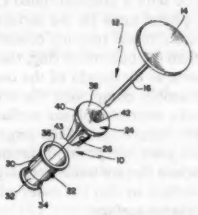
CLUTCH FOR POST EARRINGS

Marcos Fountoulakis, 24 Freemont St., Providence, R.I. 02906

Filed Oct. 20, 1983, Ser. No. 543,625

Int. Cl.³ A44B *9/00*

U.S. Cl. 24—155 R **4 Claims**



1. A clutch for post earrings and the like comprising:

a. a housing which is open at one end thereof and has an aperture through the opposite end thereof, said housing

having a generally outwardly extending peripheral flange at the open end thereof;

b. a cap member made of a sheet metal and received on the open end of said housing, said cap member comprising a substantially circular main portion having a substantially centrally disposed aperture therethrough and a generally inwardly extending peripheral flange having a pair of notches therein, said notches being disposed in substantially opposite portions of said cap member flange, said housing flange being captured betwen said cap member main portion and said cap member flange to secure said cap member to said housing; and

c. a pair of resilient leaves made of said sheet metal which extend integrally inwardly from said cap member main portion at said notches, said leaves converging with respect to each other and substantially meeting in face-to-face relation for receiving a post therebetween, said post being receivable in said clutch so that it extends through said cap member and housing apertures and is received in frictional engagement between said leaves.

4,501,051

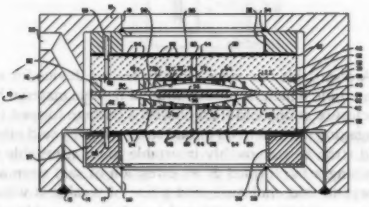
HIGH ACCURACY DIFFERENTIAL PRESSURE CAPACITIVE TRANSDUCER AND METHODS FOR MAKING SAME

Robert L. Bell, Chatsworth, and Richard A. Lathlaen, Thousand Oaks, both of Calif., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 262,545, May 11, 1981, Pat. No. 4,458,537. This application Mar. 29, 1984, Ser. No. 594,505

Int. Cl.³ G01L *9/12*

U.S. Cl. 29—25.41 **11 Claims**



2. In a method of making a differential pressure capacitance transducer of the type having a sensing diaphragm sandwiched between a pair of insulating reference plates, the steps of:

forming a planar surface on each reference plate;

depositing an electrode on the planar surface of each plate;

providing a thick film printing screen;

forming a series of concentric rings on one surface of the screen, each ring having a uniform height above the surface of the screen, the heights of the various rings varying in accordance with a predetermined contour;

forming a peripheral mask on the surface of the screen, the mask having a circular opening concentric with the rings and larger than the outermost ring, the height of the mask being the same as the height of the outermost ring;

placing the assembly comprising the screen, rings and peripheral masks over the planar surface of the reference plate with the outer edges of the rings facing the surface;

forcing a liquid glass composition through the screen from the other surface thereof while pressing the screen toward the planar surface so that the outer edges of all the rings engage the planar surface;

removing the screen;

drying the glass composition;

firing the reference plates to fuse and bond the glass layers;

sandwiching the sensing diaphragm between the reference plates with portions of the glass layers surrounding the contoured portions thereof in contact with the sensing diaphragm; and

firing the assembly to fuse and bond the plates and sensing diaphragm.

4,501,052

METHOD OF MANUFACTURING CANTILEVERED COMPOSITE STRUCTURE

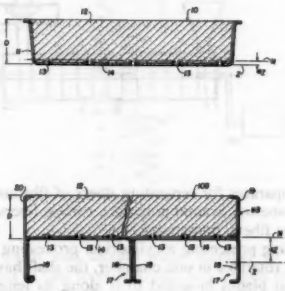
Max Mengeringhausen, Steinachstr. 5, 8700 Würzburg, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,107

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 8134667

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—155 R **2 Claims**



2. Process for the continuous manufacture of troughs of a material with high tensile strength and high elasticity modulus as outside reinforcement for cantilevered composite structure plates with a filler material of low tensile strength and low elasticity modulus, and also with sliding armatures in the trough floor in the form of holes which have funnel-shaped edges projecting over the inside of the trough, characterized by the following steps:

(a) continuously roll deforming a trough-shaped profile having a floor and side shanks on an elongated rolled-out strip material;

(b) continuously impressing holes with funnel-shaped edges projecting over the future inside of the trough, during the longitudinal movement of the trough-shaped profile, at least in its floor;

(c) with continuous longitudinal movement of the trough-shaped profile, gluing a matallic foil, drawn from a roll, on the future outside of the trough to close the holes therein;

(d) with continuous longitudinal movement of the profile, separating from the trough-shaped profile trough-shaped pieces of the lengths of the desired composite structure plate;

(e) forming a trough floor from one or a plurality of lengths the trough-shaped profile pieces having outwardly extending flex-resistant ribs of the composite structure plate, wherein when said trough floor is formed from a plurality of trough-shaped profile pieces, said pieces are connected compactly with each other on their shanks which project downward, engaging on each other, e.g. by rolled seam or point welding, screwing or riveting; and,

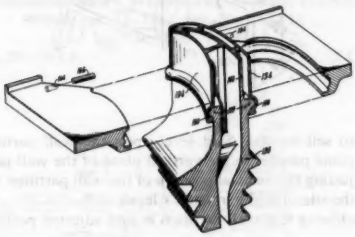
(f) connecting the one or plurality of pieces trough floor by rolled seam or point welding, screwing or riveting with a frame forming the side walls of the trough.

4,501,053

METHOD OF MAKING ROTOR BLADE FOR A ROTARY MACHINE

Harold M. Craig, and Ernest Feder, both of West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 14, 1982, Ser. No. 388,349
Int. Cl.[3] B21K *3/04;* B23P *15/02, 15/04*
U.S. Cl. 29—156.8 R 15 Claims



1. A method for making a coolable rotor blade for an axial flow rotary machine which has a spanwisely extending spar having a root section having cooling air passages extending therethrough and an airfoil section and which has a shell for defining the airfoil surface of the rotor blade, which includes the steps of:

forming a spanwisely extending spar with a projection on the spar which extends chordwisely about the spar;

joining the shell to the airfoil section of the spar and to the projection on the spar such that the shell extends telescopically over and against a portion of the projection on the spar; and

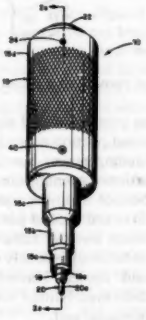
forming a platform about the spar and the shell such that the platform extends over the projection on the spar and over and against the portion of the shell extending over the projection on the spar to trap the shell between the platform and the projection on the spar.

4,501,054

HAND TOOL FOR INSTALLING COMPRESSION RINGS ON RADIAL POSITIONING DEVICES

Thomas A. Morgan, Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 29, 1983, Ser. No. 537,304
Int. Cl.[3] B23D *19/02*
U.S. Cl. 29—235 30 Claims



1. A hand tool for installing compression rings on radial positioning devices, said tool comprising:

a pair of reciprocable coaxial cylindrical shaped elements, a first outer element having a front section and a second inner element having a plurality of sections, a first section having a shaft section which extends beyond a cam shaped front section positionable within said rings and a second section having a tapered portion; and,

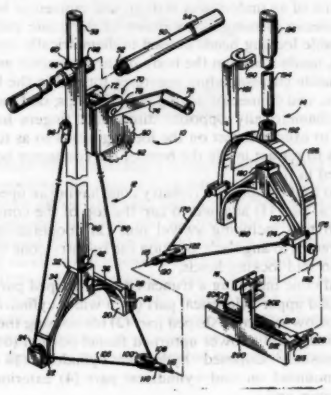
a hollow handle member having a longitudinal cylindrical cavity with an opening at one end, said reciprocable coaxial elements being slidably mounted in said cavity so that both front sections extend through said opening and the other end of said elements being independently spring biased, said handle member further including mode control means located transverse to said longitudinal cavity and including a portion of said first reciprocable element, said shaft section when depressed into said handle member preconditioning said mode control means for locking of said first element onto said handle member enabling said rings positioned by said shaft section to be installed onto said front section and said mode control means in the absence of said preconditioning, locking said first and second reciprocable elements together for ejecting said rings onto said devices when said cam shaped section is depressed into said handle member.

4,501,055

TOOL FOR COUPLING PIPE SECTIONS

Leroy George, 7915 West Orangewood, Glendale, Ariz. 85303

Filed Dec. 29, 1983, Ser. No. 566,780
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—237 6 Claims



1. An apparatus for moving the end of a second pipe section into sealing engagement with the collar of a first pipe section having an annular seal therein, said apparatus comprising:

(a) a first pipe engaging member including:

(i) a collar adapted to complimentarily engage at least a portion of the outer diameter of said first section in a position in abutment with the associated hub; and

(ii) winch means carried on said first pipe engaging member;

(iii) cable means having a first end connected at said winch;

(b) a second pipe engaging member including:

(i) a collar adapted to complimentarily engage at least a portion of the outer diameter of said second pipe section;

(ii) a yoke pivotally attached to said collar at first pivot locations; and

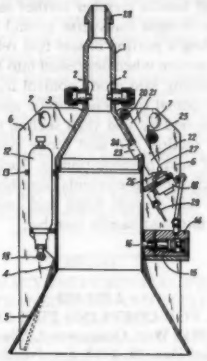
(iii) said cable having a second end secured to said yoke at pivot locations offset from said pivot locations whereby actuation of said winch will exert a joining force between said first and second pipe engaging members.

4,501,056

TOOL FOR DISCONNECTING A GUIDELINE CONNECTOR AND A PROCESS FOR USING SAME

Yvon Castel, and Michel Iato, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Apr. 20, 1983, Ser. No. 486,743
Claims priority, application France, Apr. 26, 1982, 82 07122
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—252 **7 Claims**



1. A tool for disconnecting a guideline connector on a guide column of an underwater station, said connector being locked in a sleeve forming an extension of the guide column by retractable locking heads housed in diametrically opposite positions, inside a bore in the body of the connector and penetrating inside corresponding apertures formed in the body of the sleeve, said connector having helical ramps; said tool including two diametrically opposite disconnect fingers having inner ends to exert a thrust on the locking heads so as to cause said heads to retract inside the bore of the connector body characterized in that:

said tool comprises a re-entry cone having an upper cylindrical part (1) adapted to cap the top of the connector;

said tool including swivel pins (2) cooperating with said ramps to angularly position the re-entry cone with respect to said locking heads,

said cone including a truncated cone-shaped part (3) below said upper cylindrical part (1), a wider cylindrical part (4) below said cone shaped part (3) for housing the connector body, and a lower upturned funnel portion (5);

oppositely disposed hydraulic cylinders (14 and 14*a*) mounted on said cylindrical part (4) exteriorly of said cone; and

control means exteriorly of said cone including valve means (18) for actuating said hydraulic cylinders (14 and 14*a*);

said control means including an inwardly directed contact element (23) projecting through and inwardly of the inner surface of the truncated part (3) and responsive to the pressure exerted by the connector body to actuate valve means (18) when the re-entry cone rests with its weight on the guideline connector for activating said hydraulic cylinders (14 and 14*a*) to cause retraction of said locking heads.

4,501,057

CARPENTER'S LEVEL HOLDING DEVICE AND METHOD FOR PLUMBING A WALL PARTITION

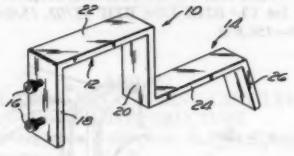
Louis M. Palomera, 4091 Manzanita, Irvine, Calif. 92714

Filed May 27, 1983, Ser. No. 498,940
Int. Cl.³ B23P *19/04;* **G01C** *9/00*
U.S. Cl. 29—407 **8 Claims**

1. A method to plumb and secure a wall partition comprising:

securing a carpenter's level in a bracket having a first portion sized to mount said level and a second portion extending in a direction perpendicular to said first portion adapted to attach said bracket to the wall partition;

placing said second portion of said bracket in a generally contiguous orientation to the header of said wall partition



to self-maintain said level upon the wall partition in a plane parallel to the vertical plane of the wall partition;

adjusting the vertical position of the wall partition by use of the site of said carpenter's level; and

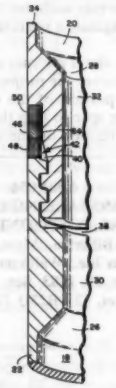
anchoring said wall partition in said adjusted position.

4,501,058

METHOD OF PRE-STRESSING A STRUCTURAL MEMBER

Jerome C. Schutzler, Orange County, Calif., assignor to PDA Engineering, Santa Ana, Calif.

Continuation-in-part of Ser. No. 70,167, Aug. 27, 1979, Pat. No. 4,294,559. This application Sep. 24, 1981, Ser. No. 305,135
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—446 **4 Claims**



1. A process for providing a pre-stress on a structural member comprising:

providing a first portion of said structural member;

providing a second portion of said structural member;

providing a fastening means between said first and second structural portions fastening same together;

providing a Nitinol member configured for placement against said first and second portions;

cooling said Nitinol member sufficiently to allow said Nitinol member to be compressively deformed; compressively deforming said cooled Nitinol member; placing said cooled and deformed Nitinol member between said first and second portions; and,

maintaining said Nitinol member between said first and second strctural portions while at the same time allowing said Nitinol member to expand from its compressively deformed state when approaching an elevated temperature for driving said first and second structural portions

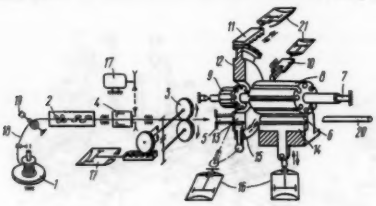
away from each other while being secured by said fastening means.

4,501,059

MACHINE FOR LAYING CONDUCTORS INTO SLOTS

Pavel I. Bukhteev, Moscow; Grigory Y. Posleider, Kherson; Viktor M. Kartavtsev, Kherson, and Vladimir S. Bytsak, Kherson, all of U.S.S.R., assignors to Nauchno-Issledovatelsky I Experimentalny Institut Avtomovilnogo Elektrooborudovania I Avtopriborov, Moscow, U.S.S.R.

Filed Apr. 13, 1982, Ser. No. 367,810
Int. Cl.³ H02K *15/00*
U.S. Cl. 29—564.5 **2 Claims**



1. A machine for making conductor sections from insulated wire and for installing said sections in armature slots of an electrical machine with ends of said sections installed in peripheral slots of a commutator for said armature according to a predetermined layout, said armature slots being oriented parallel to the axis of rotation of said armature, said commutator having a peripherally slotted portion coaxial with said armature and disposed adjacent to and axially spaced from a first end of said armature, said machine comprising:

(a) an unreeling device for providing insulated wire;

(b) a device for feeding and straightening the wire provided by said unreeling device;

(c) feeding means for intermittently feeding predetermined lengths of the wire straightened by said device;

(d) stripping means for removing the insulation from the portion of said wire corresponding to the end of each of said predetermined lengths and the beginning of the next succeeding predetermined length of the wire fed by said feeding means;

(e) cutting means for cutting the wire intermittently fed by said feeding means into predetermined cut lengths, said cutting means being aligned with said stripping means so that both ends of each cut length of wire are stripped of insulation;

(f) a receiving tray having a slot aligned with said cutting means for receiving successive cut lengths of said wire;

(g) mounting means for mounting the armature and commutator for rotation about the axis of rotation thereof, with the armature slots disposed parallel and adjacent to the slot of said receiving tray, and the slotted portion of said commutator disposed adjacent said cutting means;

(h) indexing means for rotating said armature and commutator so that successive armature slots are brought into alignment with the slot of said receiving tray;

(i) first pusher means operatively associated with said receiving tray and mounted for intermittent reciprocating movement toward and away from said armature to install each cut length of wire disposed in the slot of said receiving tray, in a corresponding armature slot;

(j) a rotary disk at least partially surrounding and coaxial with the slotted portion of said commutator, said disk adjoining said cutting means and being rotatable about said axis, said disk having a portion alignable with said cutting means for engaging one end of each cut length of wire;

(k) positioning means for rotating said disk to bring an end of each cut length of wire into alignment with a corresponding slot of said commutator according to said predetermined layout; and

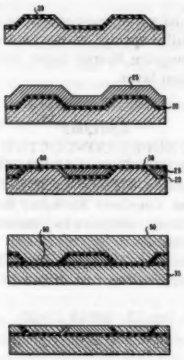
(l) second pusher means operatively associated with said rotary disk and mounted for intermittent reciprocating movement toward and away from said slotted portion of said commutator, to install each said one end of each said cut length of wire in the corresponding commutator slot.

4,501,060

DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICES

Robert C. Frye, Piscataway; Joseph E. Griffith, New Providence, and Yiu H. Wong, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 24, 1983, Ser. No. 460,399
Int. Cl.³ H01L *21/306, 21/76*
U.S. Cl. 29—576 W **6 Claims**



1. A process for producing a dielectrically isolated silicon region comprising the steps of (1) contacting a first and second body so that a silicon oxide and OH moieties are present at the interface between said first and second body and fusing said first and second bodies, wherein said fusion is accomplished by producing an electrical potential drop across said interface of less than 100 volts and subjecting said interface to a temperature of at least 1050 degrees C. whereby said silicon oxide forms at least a portion of said dielectric isolation for a region of single crystal silicon in said first or second body and (2) forming a device in said single crystal region of silicon.

4,501,061

FLUORINE PLASMA OXIDATION OF RESIDUAL SULFUR SPECIES

Gerald Wonnacott, Santa Cruz, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 31, 1983, Ser. No. 499,747
Int. Cl.³ C23F *1/02*
U.S. Cl. 29—591 **8 Claims**

1. An improved method for defining interconnect patterns in semiconductor devices having a titanium-tungsten barrier layer intermediate a silicon substrate and an aluminum conductor layer, said barrier layer being resistant to etching with a fluorine-containing plasma, said method including the steps of:

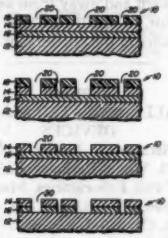
applying a positive photoresist layer including active sulfur species over the aluminum;

patterning the photoresist layer to define the desired interconnect pattern;

etching the aluminum layer in the pattern defined by the photoresist layer;

stripping the remaining photoresist layer using an oxygen plasma whereby residual sulfur species are left on the aluminum; and

etching the titanium-tungsten layer in the pattern defined by the photoresist and aluminum layers with a liquid oxidant; wherein the improvement comprises exposing the semiconductor device to a fluorine-containing plasma to remove said residual sulfur species without substantially affecting the titanium-tungsten barrier layer prior to etching the titanium-tungsten layer.



4,501,062

STABILIZED SUPER-CONDUCTOR HAVING A DIFFUSION-INHIBITING LAYER THEREIN AND METHOD OF PRODUCING SAME

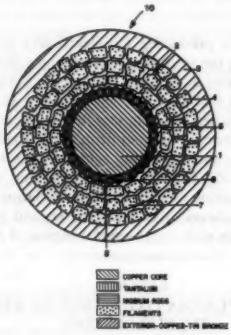
Hans Hillmann, and Engelbert Springer, both of Rodenbach, Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,179

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207159

Int. Cl.³ H01B *12/00*

U.S. Cl. 29—599 **10 Claims**



1. In a method of producing a stabilized super-conductor having a cross-sectional region of a super-conductor material consisting of an intermetallic compound containing at least two elements and having a cross-sectional region of a material which is normally conductive at operating temperatures of the super-conductive material, with a layer of a diffusion-inhibiting material positioned between the cross-sectional regions of the normally conductive material and the super-conductive material whereby a stabilized super-conductor cross-section is first assembled from all said materials and the assembled structure is subsequently deformed one or several times with intermediate annealing for reducing the cross-section of such structure until a desired cross-section dimension is attained, wherein the improvement comprises:

arranging, prior to deformation for attainment of a desired cross-section dimension, a plurality of individual rod-shaped segments, at least some of which are composed of a diffusion-inhibiting material, between said regions of normally conductive material and super-conductive material; and

subjecting the so-assembled structure to deformation conditions sufficient to combine said individual segments into a diffusion-inhibiting layer while attaining a desired conductor cross-section dimension.

4,501,063

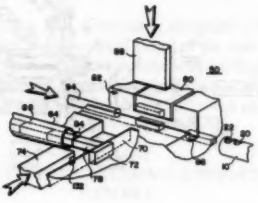
STYLUS ARM INSERTION APPARATUS

Ronald K. McNeely, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,093

Int. Cl.³ B23P *21/00*

U.S. Cl. 29—711 **20 Claims**



1. An article insertion apparatus comprising:

(A) a first passageway along which articles are fed one at a time;

(B) a second passageway in communication with said first passageway and having an abutment surface against which said articles in said first passageway are sequentially fed;

(C) a third passageway substantially parallel to and spaced from said first passageway; said third passageway having a reference surface to which said articles are consecutively presented;

(D) means for selectively mounting a workpiece in alignment with said third passageway;

(E) a transfer element reciprocably mounted in said second passageway; said transfer element, when advanced, displacing an article in engagement with said abutment surface in said second passageway to a position against said reference surface in said third passageway, while preventing the next article in said first passageway from entering into said second passageway; said transfer element, upon withdrawal, allowing said next article in said first passageway to come into engagement with said abutment surface in said second passageway; and

(F) a drive element reciprocably mounted in said third passageway for inserting an article in said third passageway into said workpiece.

4,501,064

MICRO COMPONENT ASSEMBLY MACHINE

Robert D. DiNozzi, Beverly, Mass.; Stanley R. Vancelette, Manchester, N.H.; Lionel E. Powell, Natick, Mass.; George F. McLean, Jr., Middleton, Mass.; Leon F. Sieger, Wakefield, Mass., and Ronald C. Mason, Hamilton, Mass., assignors to USM Corporation, Farmington, Conn.

Filed Sep. 8, 1981, Ser. No. 299,979

Int. Cl.³ H05K *3/30;* **B23P** *19/00*

U.S. Cl. 29—832 **20 Claims**

1. The method of placing chip-type micro-electronic components on a printed circuit board comprising:

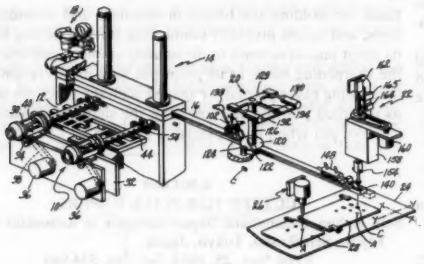
a. providing a plurality of component supply means each having a plurality of components;

b. selecting a component from a component supply means;

c. transferring a component to an enclosed conveyor;

d. transporting a component in the enclosed conveyor to a receiving means;
e. transferring a component from the receiving means to a placement means;
f. placing a component on a printed circuit board.

3. A machine for automatically placing chip-type electronic components on the conductive lands of a substrate, said machine comprising:
a. a component supply means located on support means and containing a plurality of components;
b. a conveyor having one end located on said support means for transporting the components from said supply means for receiving means;
c. means to transfer the components from said supply means and place the components on said conveyor;



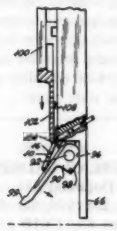
d. a verifier coacting with said machine and located on said conveyor to determine whether a given component is acceptable;
e. means to receive said components from the opposite end of said conveyor;
f. said receiving means including a placement head adapted to receive the component from said conveyor and position the components on the substrate at a predetermined desired location;
g. said conveyor including an air track that passes through the transfer mechanism and transports the components to the placement means, and
h. electrical control means associated with said machine functional to actuate each element of the machine in proper sequence.

4,501,065

WIRE PIN INSERTION METHOD AND APPARATUS

Albert W. Zemek, Windsor, N.Y., and Arthur T. Carlsen, Hallstead, Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Sep. 3, 1982, Ser. No. 414,906
Int. Cl.³ H05K *3/00*
U.S. Cl. 29—845 **6 Claims**



1. A method for cyclically inserting and driving a wire pin of a string of end-to-end connected pins into a substrate hole, each of said pins having a longitudinal axis and preformed, reduced cross-section areas of interconnection between pins of said string to provide a front end and a rear end for each pin, said method comprising the steps of:
receiving said pin with said longitudinal axis at an angle to a central axis of said hole;
engaging said pin rear end and changing said angle and engaging said front end to urge a portion of said pin into a guide slot during said angle changing and generally aligning said longitudinal and central axes for said inserting, said guide slot having internal faces;
separating said pin from said string;
yieldingly engaging said front end and preventing loss of control of said pin during said angle changing; and
driving said pin into said hole while engaging and urging said rear end into sliding engagement with said faces of said slot during said driving and prior to said inserting, such that guiding and said aligning of said pin occurs.

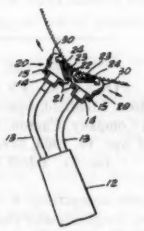
4. An apparatus for cyclically inserting and driving a wire pin of a string of end-to-end connected pins into a hole of a substrate, each of said pins having a longitudinal axis, reduced cross-section areas of interconnection between pins of said string to provide a front end and a rear end for each pin, and means, enlarged in at least one cross-sectional dimension relative to a pin body cross-section, for providing an interference fit in said hole, said apparatus comprising:
means for supporting said apparatus adjacent said substrate;
means operatively associated with said support means for receiving said pin with said longitudinal axis at an angle to a central axis of said hole;
means, operatively associated with and moveable relative to said receiving means, for engaging said pin and changing said angle and generally aligning said longitudinal and central axes for said inserting, said pin being fed to said engaging means from said receiving means;
means, moveable relative to and operatively associated with said angle changing means, for yieldingly engaging and preventing loss of control of said pin during said angle changing;
means, operatively associated with said angle changing means, for engaging said interference fit providing means after said angle changing and for separating said pin from said string by applying a force threto generally parallel to said longitudinal axis;
means, operatively associated with and moveable relative to said separating means, for driving said pin into said hole and effecting said interference fit; and
means, operatively associated with said engaging and driving means, for actuating said engaging and driving means.

4,501,066

DUAL HEADED RAZOR SYSTEM

Conrad T. Sceberras, 3101 S. Capa Dr., Hacienda Heights, Calif. 91745

Filed Apr. 11, 1983, Ser. No. 483,657
Int. Cl.³ B26B *21/14, 21/00, 21/08*
U.S. Cl. 30—50 **5 Claims**



1. A razor system for use in shaving in both to and fro

strokes without removal from the surface being shaved comprising:

an elongated handle having a pair of spaced apart parallel channel shaped members having the mid-length thereof fixedly and immovably secured to and facing away from one end thereof each having out turned lips along the upper edges of their respective sidewalls and lying in a common plane inclined acutely to the longitudinal axis of said handle;

a pair of detachable razor heads telescopically assembled to a respective one of said channel shaped members;

said heads each having a blade clamped therein and lying in planes flaring outwardly in opposite directions and away from the common plane through the lips of said channel shaped members at substantially the same acute angle;

the adjacent lateral edges of said blades lying parallel to one another and being unsharpened and the other lateral edges being parallel and sharpened and remote from one another; and

said heads each having a low height end wall along each end having the outer edge thereof lying in a plane spaced closely outwardly of the sharpened edges of a respective one of said blades.

4,501,067

RAZORS AND SHAVING UNITS FOR RAZORS

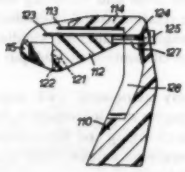
David S. Duncan, London, England, assignor to Wilkinson Sword Limited, High Wycombe, England

Filed Mar. 23, 1983, Ser. No. 478,178

Claims priority, application United Kingdom, Apr. 3, 1982, 8209979; Dec. 6, 1982, 8234699

Int. Cl.³ B26B *21/14, 21/00, 21/08, 21/28*

U.S. Cl. 30—63 **4 Claims**



1. A razor blade assembly comprising a pair of blades each having a cutting edge; a guardbar; a top cap which covers a substantial portion of each blade and cooperates with the guardbar in locating the blade edges correctly with respect to the skin of a person shaving; and means mounting the guardbar for movement relative to the top cap from a position in which each blade edge is correctly exposed for shaving, to a position in which the guardbar screens each blade from contact with the person handling the blade assembly, said mounting means including a platform pivotable relative to said top cap and on which the guardbar is rigidly mounted, one of said blades being rigidly secured to the top cap and the other of said blades being rigidly secured to the platform, said blade edges being staggered with respect to each other when correctly exposed for shaving.

4,501,068

POCKETKNIFE HONE

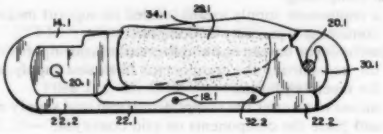
Richard C. J. Palson, Medfield, Mass., assignor to The Phillips Manufacturing Company, Canton, Mass.

Filed Apr. 14, 1983, Ser. No. 484,899

Int. Cl.³ B26B *5/00*

U.S. Cl. 30—138 **6 Claims**

1. A pocketknife comprising a handle defining a blade-receiving chamber longitudinally thereof, a pivot pin fixed to the handle at each end within the chamber, a knife blade pivotally mounted at one end on the pivot at one end of the chamber, a sharpening blade pivotally mounted at one end on the pivot pin at the other end of the chamber, said knife blade and sharpening blade being dimensioned to be sheathed within the chamber in parallel relation to each other for movement from a sheathed position within the chamber to a position extending therefrom, spring means yieldably engaged with the proximal end of the knife blade and the proximal end of the sharpening



blade for holding the blades in sheathed and extended positions, and means pivotally connecting the sharpening blade to its pivot pin, structured to detachably connect said one end of the sharpening blade to its pivot pin, said means retaining the sharpening blade pivotally engaged with the pivot pin when in its sheathed position and releasing the sharpening blade from its pivot pin when in its extended position.

4,501,069

CUTTER FOR WALL PAPERS

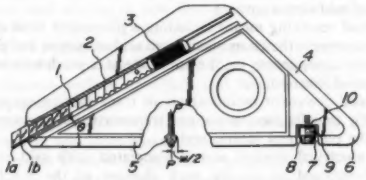
Seiji Kohno, Sagamihara, Japan, assignor to Kabushiki Kaisha Tajima Seisakusho, Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 554,961

Claims priority, application Japan, Sep. 22, 1983, 58-145878[U]

Int. Cl.³ B26B *1/08*

U.S. Cl. 30—293 **8 Claims**



1. A cutter for wall papers comprising a sheath receiving an exchangeable cutting blade slidably therein so as to extend and retract its cutting tip from and into said sheath, and a grip for holding said sheath embedded therein and substantially triangular whose base is its longest edge and defines a slide edge extending at a relatively small acute angle with a cutting edge of said cutting blade and having a V-shaped cross-section symmetrical with respect to a phantom plane containing said cutting blade extending slightly beyond a line of prolongation of said slide edge, said grip being formed in said slide edge with a notch near a rear end opposite to said cutting tip, and a frusto-conical roller freely rotatable in said notch and slightly extending on both sides of the slide edge, thereby reducing sliding resistance of the slide edge.

4,501,070

PIPE THREAD GAUGING TOOL

Stephen L. Jiles, 1513 Dogwood Ave., Anaheim, Calif. 92801

Filed Jan. 23, 1984, Ser. No. 572,826

Int. Cl.³ G01B *3/36*

U.S. Cl. 33—199 R **12 Claims**

1. A tool for gauging pipe threads accurately, including:

a base portion having an opening therethrough for supporting therein a ring gauge;

a body portion mechanically coupled to said base portion,

said body portion having an opening therethrough for communication with said opening in said base portion;

an anvil portion supported from said body portion and having an axial opening therethrough coaxial with said opening on said body portion;

a shaft, having first and second ends, slidably retained in said opening through said anvil and extending, at its first end, into said opening in said base portion and, at its second end, extending beyond said anvil portion;

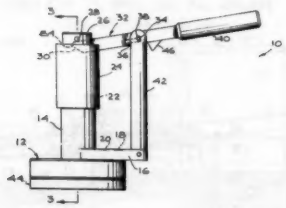
a hammer, secured to said second end of said shaft, said hammer having first and second faces;

a slot diametrically disposed in said hammer and passing through said first face of said hammer;

a bolt traversing said slot near said first face;

a pivot arm supporting from said base portion and having, proximate its upper end, a pivot rod positioned substantially parallel with said bolt traversing said slot in said hammer;

a handle having a grip end and an actuating end with a top and having a slot therein for cooperating with said pivot rod to permit pivoting and sliding of said handle about and along said pivot rod, said slot having first and second ends, said slot having such position in said handle that said



actuating end of said handle is movable about said pivot rod and along said slot to the first end of said slot, in which position said handle is, at its actuating end, under and in engagement with said bolt near the tip of said actuating end;

said first end of said shaft bearing flange means;

said body portion including a flange portion positioned in said opening therethrough at the end of said body portion proximate to said anvil portion

a compression spring encompassing said shaft in the region between said flange means on said shaft and said flange portion in said body portion and sized, diametrically, to engage said flange means and said flange portion, upon compression of said spring;

whereby, upon depression of said grip end of said handle said actuating end thereof moves said hammer portion away from said anvil portion and compresses said compression spring, storing potential energy therein, which energy is released upon depressing said grip end of said handle until said actuating end of said handle is disengaged from said bolt and said hammer is urged forcefully toward said anvil portion by said potential energy in said spring.

4,501,071

MOUNTING SYSTEM FOR OPTICAL SIGHTING DEVICES

Heinz J. Manske, Mitchell, Ind., assignor to John W. B. Foringer, Bedford, Ind.

Filed Dec. 27, 1982, Ser. No. 453,756
Int. Cl.³ F41G *3/00*
U.S. Cl. 33—245 **7 Claims**

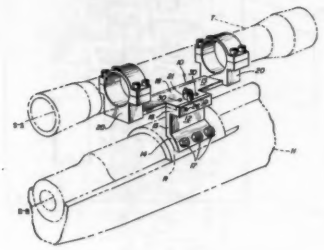
1. A mounting system for repeatedly attaching and detaching an optical sighting device having a sighting axis to and from a guided device having a base axis while preserving precise alignment between said axes, said system comprising, in combination:

(a) a base member adapted for fixed attachment to said device;

(b) a mounting platform defined on said base member;

(c) a holder member including means for securing the optical sighting device thereto;

(d) means for detachably locating said holder member on said mounting platform of said base member, said means including first and second pairs of precisely spaced com-



plemental locating elements, said first pair being oriented transversely of the base axis, said second pair being oriented in a different direction from said first pair such that each pair of said elements is adapted to enter into complemental engagement simultaneously to oppose relative movement between said base and holder members in any direction along the plane of said mounting platform; and

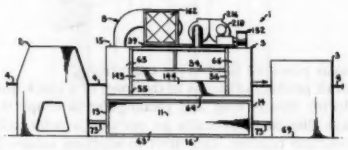
(e) means for detachably clamping said holder member to said base mounting platform with said locating elements in complemental engagement.

4,501,072

DRYER AND PRINTED MATERIAL AND THE LIKE

Cecil T. Jacobi, Jr.; Charles G. Maupin; James B. Woodsmall; William J. Brown; Bruce E. Thomas, all of Marshall; Walton D. Owens, Slater; Robert J. Cunningham, and Rocky D. Smith, both of Marshall, all of Mo., assignors to Amjo, Inc., Marshall, Mo.

Filed Jul. 11, 1983, Ser. No. 512,724
Int. Cl.³ F26B *3/34, 13/00;* F27B *9/06*
U.S. Cl. 34—1 **30 Claims**



23. A method of drying a web of printed material, which comprises the steps of:

(a) detecting movement of a printed material web with respect to a dryer;

(b) moving a pair of heater panel assemblies each including a heat lamp to a closed position whereat said heat lamps are in close proximity to said printed material web from an open position with said heat lamps spaced relatively further from said printed material web, said movements being guided by guide means;

(c) actuating said heat lamps; and

(d) blowing air from an air blower through a duct to at least one said heater panel assembly for communication with said printed material in said dryer to facilitate drying said printed material.

4,501,073

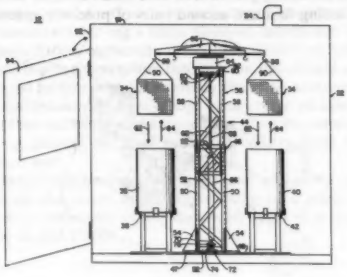
APPARATUS AND METHOD FOR DEHYDRATING METAL PIECES

Mark J. Walz, Northboro, Mass., assignor to Nuclear Metals, Inc., Concord, Mass.

Filed Jan. 24, 1983, Ser. No. 460,647

Int. Cl.³ F26B *3/00, 19/00;* C21D *1/62;* F27B *15/00*

U.S. Cl. 34—9 **27 Claims**



19. A method of dehydrating metal pieces comprising: introducing said pieces into an oil heated to the boiling point of water to boil off the water; and removing said pieces from said oil.

4,501,074

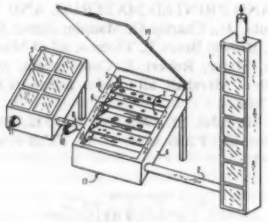
CONVECTION POWERED SOLAR FOOD DRYER

Louis R. O'Hare, 1041 Ponderosa, Apt. 2, Fort Collins, Colo. 80521

Filed Feb. 17, 1981, Ser. No. 234,970

Int. Cl.³ F26B *9/06*

U.S. Cl. 34—93 **2 Claims**



1. A solar powered food dryer comprising;

(1) a draft producing means in the form of a black box solar collector that is long and rectangular in shape with its length disposed vertically to provide a solar activated convection column, said draft production means having an opening at the top and a duct attached at the bottom and said duct being in fluidflow communication between the internal cavity of said convection column and,

(2) an air dryer means in the form of a compartment the walls of which support shelves for holding foodstuffs to be dryer and said compartment having a door and having sides surmounted by a plurality of plenum chambers in fluidflow communication with the drying compartment by means of small holes in the compartment and plenum walls, said plurality of plenums being comprised of essentially two plenums, one plenum being in upstream fluidflow communication with the drying compartment and the other in downstream communication and situated on another side of the compartment in such a way that air leaving the upstream plenum will diffuse approximately evenly through the drying chamber to this downstream plenum and said downstream plenum being in fluidflow relationship with the convection column duct to direct the convection-produced draft into the dryer compartment and said upstream plenum being in fluidflow communication by means of ducting to

(3) a solar air heating and temperature regulating means in the form of a black box solar collector with an air inlet valve attached to an air inlet port and said heating collector having an exit port connected to ducting which is in fluidflow communication both with the air dryer means and with a valve opening to ambient air.

4,501,075

APPARATUS FOR REMOVING CONDENSATE FROM A STEAM HEATED ROTATABLE DRYING CYLINDER AND THE LIKE

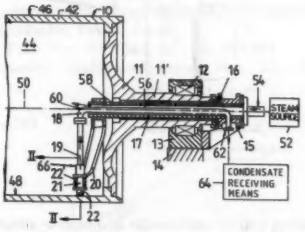
Karl Jenkner, Heidenheim; Karl Steiner, and Robert Wolf, both of Herbrechtingen, all of Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 446,959

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148948

Int. Cl.³ F26B *25/20*

U.S. Cl. 34—125 **6 Claims**



1. An intake structure for receiving therein condensate from an inner chamber of a steam heated drying cylinder assembly which is rotatable about an axis of rotation, which has a generally cylindrical inner surface defining a portion of said inner chamber and against which said condensate forms, and which has a stationary condensate-transporting conduit means for delivering condensate to a receiving area externally of said drying cylinder assembly, said intake structure comprising nozzle-like body means, inlet opening means formed in said nozzle-like body means, an outlet formed in said nozzle-like body means and being effective for communication with said stationary condensate-transporting conduit means, said inlet opening means being juxtaposed to and open towards said cylindrical inner surface when said nozzle-like body means is operatively connected to said stationary condensate-transporting conduit means in order to achieve said communication with said outlet, said nozzle-like body means comprising a generally forwardly situated end surface and a rearwardly disposed end surface, said inlet opening means having a generally forwardly situated end portion and a rearwardly disposed end portion, said rearwardly disposed end portion being defined by a rearwardly situated end wall of said nozzle-like body means, said nozzle-like body means when operatively connected to said stationary condensate-transporting conduit means being so positioned as to have said forwardly and rearwardly disposed inlet opening end portions so arranged with respect to each other and said forwardly situated end surface and said rearwardly disposed end surface so arranged with respect to each other as to result in the rotating cylindrical inner surface first traversing said forwardly situated end surface and forwardly situated end portion and subsequently traverse said rearwardly situated end portion followed by traversing said rearwardly situated end wall and said rearwardly disposed end surface, and wherein said rearwardly

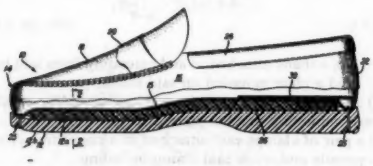
situated end wall carries said rearwardly disposed end surface and comprises a generally inner surface means effective for scooping at least a portion of said condensate from said rotating cylindrical inner surface and directing such scooped condensate into said stationary condensate-transporting conduit means, wherein the inner width of said inlet opening means when measured parallel to said axis of rotation is as a maximum generally equal to the diameter of the flow passage defined by said condensate-transporting conduit means, wherein said forwardly situated inlet end portion extends as a recess-like opening through said forwardly situated end surface, said recess-like opening being so formed through said forwardly situated end surface as to result in those portions of said forwardly situated end surface which are located at opposite sides of said recess-like opening extending toward said cylindrical inner surface, and wherein the flow area of said recess-like opening is in the order of 0.1 to 0.2 of the cross-sectional flow area defined by said condensate-transporting conduit means.

4,501,076

SHOE CONSTRUCTION

Stephen G. Dodds, Farmington, Me., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Oct. 25, 1982, Ser. No. 436,394
Int. Cl.³ A43B *3/14*
U.S. Cl. 36—11 **5 Claims**



1. A true moc shoe comprising an upper having a vamp with unitary bottom and side portions, a sole coextensive with said vamp bottom portion, said sole having an upper contacting surface and a contact walking surface, a plurality of stitches extending around a peripheral portion of said sole and stitching said sole directly to said vamp bottom portion, and a layer of cushioning material abutting said vamp and the upper contacting surface of said sole, wherein said cushioning layer is sized to be substantially coextensive with said sole and has edges spaced from said stitches, and wherein said stitches apply a force on portions adjacent said cushioning layer edges for tightly securing said layer in place between said vamp and sole.

2. A shoe as defined in claim 1, wherein said sole is formed of flexible rubber.

4,501,077

SOLE FOR BOOTS AND SHOES

Delton W. Young, Belmont, Mass., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 1, 1983, Ser. No. 481,183
Int. Cl.³ A43B *13/04, 13/00*
U.S. Cl. 36—32 R **15 Claims**

1. A sole for boots, shoes and the like, including a heel at the rear end of said sole, said sole having a pair of edges which extend the length of said sole, comprising:

(a) said heel having a rear portion at the rear end of said heel and a breast at the front of said heel, said breast being substantially perpendicular to the length of the sole;

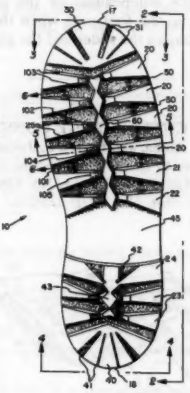
(b) a toe portion at the front end of said sole

(c) a shank area adjacent to said heel; and

(d) a tread portion extending continuously between said toe portion and said shank area; said tread portion comprising:

(1) a plurality of main lugs which are substantially perpendicular to the length of the sole, with said lugs increasing in width from the inside to the outer edge of the sole; and

(2) a continuous center lug which is substantially parallel



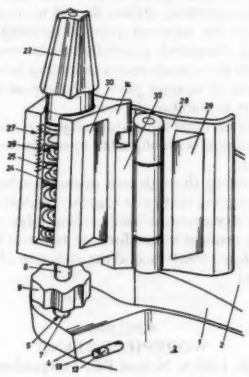
to the length of the sole and being connected to said plurality of main lugs on both of its sides, said center lug is approximately an equal distance from the edges of said sole.

4,501,078

SKIING BOOT

Ernst Kopp, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Sep. 27, 1982, Ser. No. 423,742
Claims priority, application Austria, Sep. 30, 1981, 4189/81
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—121 **9 Claims**



1. A skiing boot comprising:

a foot part,

a gaiter pivotably mounted on the foot part,

a slider slidably mounted on the gaiter,

an adjustable spring means cooperating with the slider for exerting a force opposing a bending forward movement of the gaiter;

a releasable coupling means for coupling the gaiter and slider,

means for adjusting the stress on the adjustable spring means, and

means interconnecting the slider and the foot part for adjust-

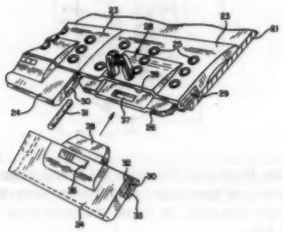
ing the inclination of the gaiter relative to the foot part, the inclination of the gaiter relative to the foot part being adjustable independent of the stress on the adjustable spring means and the stress on the adjustable spring means being adjustable independent of the inclination of the gaiter relative to the foot part when the releasable coupling means couples the slider and the gaiter in a coupling position.

4,501,079

TWO PIECE CUTTING EDGE CONSTRUCTION

Frederick C. Hahn, Aloha, and Larren F. Jones, Beaverton, both of Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Aug. 24, 1983, Ser. No. 526,001
Int. Cl.³ E02F *3/76*
U.S. Cl. 37—141 R **13 Claims**



1. A multi-part cutting edge structure comprising: a plurality of adapter parts adapted to be secured to an earth moving unit in side-by-side relation and projecting forwardly therefrom,

a cutting edge part adapted to be removably mounted on each adapter part by rearward movement relative thereto and projecting forwardly to provide side-by-side cutting edge parts,

each of said parts being generally plate-like and having forwardly-extending side edges, each side edge having a forwardly-extending groove therein to cooperate with the groove of the adjacent part in defining a forwardly-extending, elongated, generally tubular recess,

an elongated pin in each recess extending forwardly to span both a pair of adapter parts and their associated cutting edge parts to stabilize the same,

each adapter part and the cutting edge part mounted thereon being equipped with alignable openings for the receipt of a lock, and

a lock extending through said openings when aligned and rigidly coupling said parts together against forward disassembling movement of said cutting edge part, said lock including resilient means for lock removal by the application of a force transverse to the direction of said rearward movement.

4,501,080

WORKPIECE STAND

Homer C. Rich, 1100 S. Noland Rd., Independence, Mo. 64050

Filed Sep. 2, 1983, Ser. No. 529,139
Int. Cl.³ D06C *3/08*
U.S. Cl. 38—102.7 **10 Claims**

1. A workpiece stand, which comprises:

(a) a base including:

(1) a base cylinder with upper and lower ends and a standard receiver extending therebetween, said standard receiver including a threaded portion; and

(2) a plurality of legs extending radially outwardly from said base cylinder;

(b) a standard including threaded upper and lower ends, said standard lower end being threadably received in said standard receiver;

(c) a universal joint assembly including:

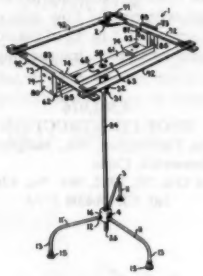
(1) a casing with upper and lower ends;

(2) a casing bore extending between said casing upper and lower ends and including a threaded portion and a lip restricting the diameter of said bore adjacent said casing upper end;

(3) a screw plug threadably received in said casing bore threaded portion, said screw plug having a threaded screw plug receiver extending therethrough and adapted to receive said standard upper end;

(4) a spring positioned in said casing bore and engaging said standard upper end;

(5) a mounting bracket having a ball end positioned within said casing bore and urged by said spring against said



lip, a shank attached to and extending from said ball end and a plate mounted on said shank;

(d) a cross arm with opposite ends and a middle attached to said mounting bracket plate; and

(e) a pair of clamps each attached to a respective cross arm opposite end, each said clamp including:

(1) a clamp base plate mounted on said cross arm opposite end and longitudinally movable relative thereto;

(2) an outer clamp upright connectd to said base plate;

(3) an inner clamp upright positioned in spaced relation with respect to said outer clamp upright;

(4) a spacer positioned between and engaging said clamp uprights; and

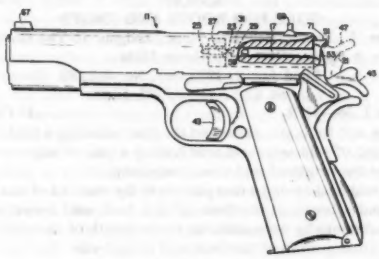
(5) connector means enagaging said uprights and adapted for drawing said uprights together.

4,501,081

DRY FIRE UNIT

Michael T. Izumi, 601 N. Virgil Ave., Los Angeles, Calif. 90004

Filed Sep. 29, 1982, Ser. No. 428,431
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—1 R **8 Claims**



1. In combination with a gun having a frame, a hammer movable from a cocked position to an energy releasing position, a firing pin receiving means in the frame, a cartridge

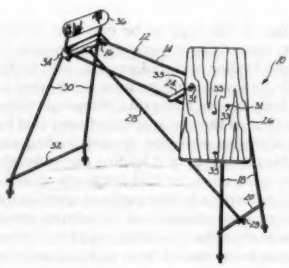
chamber, a removable firing pin assembly including a firing pin and a spring to actuate the firing pin, and said firing pin receiving means terminating in a firing pin hole through which the firing pin may travel to contact and fire a cartridge in the cartridge chamber, a dry firing unit which comprises a shaft of energy absorbing material adapted to be removably disposed in the firing pin receiving means, and a projection at one end of said shaft protruding longitudinally and laterally from said firing pin receiving means in the path of travel of said hammer to contact and absorb energy from said hammer, said unit being shorter in its longitudinal extent into the firing pin receiving means than the firing pin assembly.

4,501,082

PORTABLE BENCH REST

F. Joseph Phillips, 313 Fourth Ave., Bradley Beach, N.J. 07720; Paul E. Phillips, 213 Laurel Pl., Neptune, N.J. 07752; Peter J. Phillips, 1902 B St., Belmar, N.J. 07719, and Brian Phillips, 213 Laurel Pl., Neptune, N.J. 07753

Filed Apr. 13, 1983, Ser. No. 484,458
Int. Cl.³ F41C *29/00*
U.S. Cl. 42—94 **3 Claims**



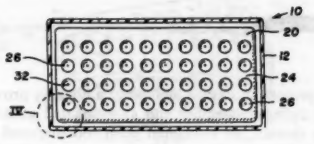
1. A shooting bench comprising a frame which includes an upper cross member and leg means pivotally connected at each end of said cross member, said leg means each being shiftable about its pivot connection to said cross member between a collapsed position overlying the cross member and an extended position depending from the cross member, said leg means for supporting said cross member upon the ground in a rigid position when in said extended positions, rest means carried by one of said leg means positionable above said cross member when said one leg means is shifted into its said extended position for supporting a rifle or similar device, a brace removably connected between said cross member and a said leg means when in its said extended position, and platform means secured to said cross member for supporting the arms of the rifle user, said platform means including a plurality of selectively spaced openings, said upper cross member having openings formed therein alignable with at least two of said openings formed in said platform means depending upon the desired angular orientation of the platform means in a generally horizontal plane relative to the upper cross member, securing members extending through said aligned openings in the upper cross member and platform means for securing the platform means to the cross member in said desired angular orientation.

4,501,083

METHOD FOR FORMING AND HOLDING CHEESE FISH BAIT

Robert Ong, 10964 Wellworth St., Apt. 103, Los Angeles, Calif. 90024

Filed Sep. 29, 1982, Ser. No. 427,889
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—4.5 **3 Claims**



1. A method for making baited hooks for fishing comprising the steps of:

(a) providing a flat surface having a plurality of indentations therein each being of a diameter and depth adapted to receive a fish hook therein;

(b) providing a vent to atmosphere in the bottom of each said indentation;

(c) mixing fish bait to a spreadable but non-flowing consistency;

(d) inserting the spreadable fish bait across into said indentations;

(e) inserting fish hooks into the fish bait in respective ones of said indentations; and,

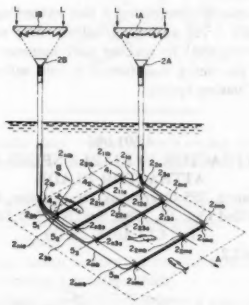
(f) withdrawing said fish hooks in combination with the fish bait.

4,501,084

FISHING NET

Kei Mori, No. 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,337
Claims priority, application Japan, Aug. 11, 1982, 57-139297
Int. Cl.³ A01K *75/02*
U.S. Cl. 43—17.5 **4 Claims**



1. A fishing net including a photoconductive cable comprising a plurality of optical fibers having light-emitting portions, said light-emitting portions are divided into a first group adapted to emit light having a favorable influence upon fish and a second group adapted to emit light having an adverse influence upon fish, and the direction of light emanating from said first group of light-emitting portions is counter to that of light emanating from said second group of light-emitting portions, whereby fish are influenced in traveling into said net by said light of favorable influence and discouraged from leaving by said light having said adverse influence.

4,501,085

CASTING ROD

Lant I. Barnes, 10811 Clearbrook La., Dallas, Tex. 75218

Filed Dec. 31, 1981, Ser. No. 336,504
Int. Cl.³ A01K *91/02*
U.S. Cl. 43—19 **1 Claim**

1. In a projecting device including: a housing providing an elongated cylinder chamber and an elongated guide passage forwardly thereof; an elongated push rod disposed partially within said housing chamber and passage, having a piston mounted adjacent to its rearward end for coaction with said cylinder chamber and having means at its exposed forward end for carrying a plug to be projected; a valve in said housing for controlling the flow of pressurized gas into said cylinder chamber to impel said piston and push rod forward; an actuator pin disposed in said housing for actuating said valve; a spring biased hammer for impacting said actuator pin; and trigger means for locking said hammer in a cocked position and for releasing said hammer to impact said actuator pin; the improvement comprising

said valve comprising a ball closure member, and an annular seat member providing a band seal with said ball closure member; and spring means urging said ball closure member into sealing engagement with said seat member;

said annular seat member providing a central passage for gas flow and for receiving said actuator pin to engage and unseat said ball closure member;

said housing including an inner tubular wall defining said cylinder chamber, and an outer wall defining a hammer chamber; said hammer being disposed for reciprocation in said hammer chamber;

a biasing compression spring disposed in said hammer chamber for urging said hammer rearward;

said housing outer wall having a longitudinal slot, and said hammer having a radially projecting pin extending through said longitudinal slot to enable manual shifting of said hammer;

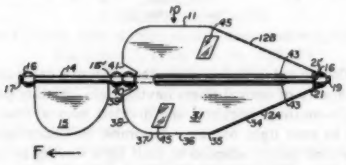
and safety means comprising a slot extending laterally and rearwardly from said longitudinal slot; said safety slot being configured to receive said hammer pin; and said hammer pin being maintained in said safety slot by said hammer biasing spring.

4,501,086

FISH ATTRACTOR VARIABLE SPEED SLIDING ATTRACTOR BLADE

William A. Bunce, 355 Overbrook Dr., Folsom, Calif. 95630

Filed Oct. 13, 1983, Ser. No. 541,540
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.2 **10 Claims**



1. A fish attractor blade adapted to be used with lures or bait and to be disposed upon a fishing line, which comprises:

an elongated hollow tubular member having a component securing means at opposite ends thereof,

a forward rudder blade depending outwardly from said tubular member,

a pair of spaced bore centering tabs disposed on said tubular member,

a main body portion having a front end and a back end, comprised of two mirror image, spaced horizontally, aligned planar segments interconnected at opposite ends thereof to form a planar member; one end of each of which is mounted upon the first of said tabs, at the front, and the back end is mounted 180° opposed on the second of said centering tabs to provide an angular disposition relative to said tabs, each planar segment having an inwardly depending trailing edge,

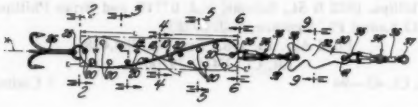
each side of the planar member having an oppositely disposed triangular turning fin, one of which is disposed upwardly and the other downwardly from the respective trailing edges of the said segments of the planar member.

4,501,087

FISHING EQUIPMENT

Bradley E. Blomquist, 3210 Lake George Rd., Lake Orion, Mich. 48035

Filed Jun. 10, 1982, Ser. No. 387,045
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.06 **2 Claims**



1. A fishing lure of the type to be cast and retrieved or trolled, said lure comprising a body having width, length, thickness, sides and leading and trailing ends, said body being formed to provide a twisted configuration and having a longitudinal axis, said body having a plurality of separate turbulence producing means formed thereon spaced between said axis and said sides, fishook means provided at said trialing end and fishing line attaching means at said leading end, whereby said body is caused to revolve about said longitudinal axis when said lure is trolled or retrieved, the rotational speed in distance traveled of each of said plurality of turbulence producing means being greater than the rotational speed at said axis by reason of said means being spaced from said axis and near said sides and thus causing greater water turbulence than if said means were at said axis, said fishing line attaching means including means for preventing lure twist from twisting the fishing line, said latter means including a combination of at least one swivel and a flat anti-twist element extending on both sides of said axis so as to be acted upon by water resistance on both sides of said axis, said flat element being formed in the shape of a minnow, including a head, a body with fins on both sides and a fluked tail, said shape being substantially symmetrical with respect to said axis, said lure simulating a fish attacking a minnow.

4,501,088

FLY TRAP WITH DISPOSABLE COLLECTOR

J. Roger Boisvert, 6638 Beeman Ave.; Samuel Schultz, 12619 Archwood St., both of North Hollywood, Calif. 91606, and Robert Blaugrund, 510 Leslie La., Beverly Hills, Calif. 90210

Filed Jan. 5, 1983, Ser. No. 455,748
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—118 **7 Claims**

1. A fly trap comprising first screen means forming a generally vertical outer wall,

second screen means forming a generally vertical second wall concentrically disposed within said first wall to thereby define a central region (I) surrounded by generally annular region (II), means forming a plurality of openings about and through the surface of said vertical second wall for flies to migrate from region (I) to region

(II), roof means connecting and covering said first and second screen means at their upper ends, floor means interconnecting and closing the bottom ends of the screen means and having a plurality of openings therein positioned about and through the bottom of region II to provide a egress for falling flies,

means including floor means forming a plurality of inlet porches constructed to provide insect entry from the outside of the outer wall through the inside of the inner wall said porches including tapered walls which diverge downwardly into full contact with the floor means and converge to form a fly entrance at the inner wall on which and through which the flies enter from the outside into the central region (I), means for receiving a fly attractant in said central region (I), said tapered walls also forming within region I interior walls which converge towards the lower openings, said inner and outer walls and porch walls being significantly more vertical than the angle of repose of dead flies, said outer wall, inner wall and roof, together with porch walls, defining a generally annular

region encircling the first region about a substantial vertical extent thereof, said annular region being horizontally continuous about the first region except where interrupted slightly at the lower extremities by porch walls so that well fed flies in region I are attracted to region II by the light, air and flies flitting about in region II to enter into that region from the region I, and flies outside the trap are attracted by the attractant and by the sight and noise of flitting flies in region II, the latter being able to encircle the region I in their general activity, the supply of flies in region II being continually replenished from region I and being kept fresh and moving by attrition of the tired, falling flies which are readily and directly removed by falling through the floor openings, chute means connected to the floor openings and depending downwardly to form a third region III in the shape of a downwardly convergent walls lying below the floor and forming a slide for dead and dying flies, means forming a removable container for receiving the dead and dying flies and connected to the lowermost end of the chute.

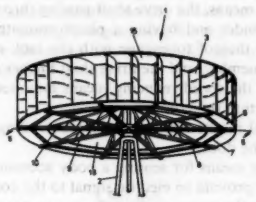
4,501,089

FROST CONTROL

Kenneth J. Cobden, Mildura, Australia, assignor to Cobden Turbines Pty. Ltd., Mildura, Australia

Filed Dec. 3, 1982, Ser. No. 446,723
Claims priority, application Australia, Aug. 10, 1982, PF5308
Int. Cl.³ A01G *13/00*
U.S. Cl. 47—2 **5 Claims**

1. Apparatus for the frost control of agricultural and horticultural crops, said apparatus comprising a tower supporting at its upper end a radial flow fan, means to drive said fan to rotate about a vertical axis to draw air axially into the fan from above the inversion layer and discharge this air radially over the crop, said fan including a plurality of peripheral aerofoil shaped vertical blades mounted on an annular ring at the periphery of the fan, each blade being curved with a convex surface thereof facing in the direction of rotation and having a leading edge and a trailing edge, said convex surface including a straight portion adjacent the leading edge, a curved central portion and a straight portion adjacent the trailing edge, the cord line of the said blades being between 15° and 25° from a radial line of the fan, the point of highest position from the cord line being toward the leading edge of the blade, the leading edge being innermost and the trailing edge being at the periphery of the fan whereby on rotation the air flows axially into the fan interior intermediate said blades and then curves to have a generally radial component before being encountered by the blades.

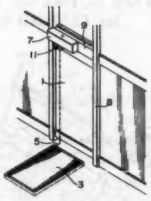


4,501,090

AUTOMATIC DOOR OPERATOR FOR SWING DOORS

Kei Yoshida; Masayuki Murokawa, and Toshiaki Nomura, all of Tokyo, Japan, assignors to Chikura Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,867
Claims priority, application Japan, Apr. 12, 1982, 57-60472
Int. Cl.³ E05F *13/00*
U.S. Cl. 49—264 **3 Claims**



1. An automatic door operator for a swing door supported by a door supporting frame to swing about a vertical axis, comprising:

(a) opening and closing means attached to the swing door, for opening and closing the swing door;

(b) a support plate;

(c) an electric motor supported on one side of the support plate and having a rotation shaft;

(d) speed reducing means comprising a gear train disposed on the other side of the support plate and connected to the rotation shaft, the speed reducing means having a last gear member disposed remotely from the rotation shaft;

(e) a door closer supported on the one side of the support plate, including:

a hollow cylinder having closed opposite ends and containing an oil therein;

a piston member slidably and sealingly fitted into the cylinder and axially spring-biased to close the door, the piston member having a first passage and a second passage formed therethrough, each of said passages communicating one side of the cylinder to the other side, the second passage having a check valve incorporated therein so that

the check valve is closed when the piston member is moved in a direction to close the door; and

a rack member attached to the piston member to extend in the axial direction of the cylinder;

a drive shaft perpendicularly passing through and rotatably supported by the support plate so as to be connected to the opening and closing means for driving the opening and closing means, the drive shaft passing through the wall of the cylinder and having a pinion mounted on one end portion thereof to engage with the rack member of the piston member, and the drive shaft further having the last gear of the speed reducing means mounted on the other end portion thereof;

(g) control means for electrically controlling the motor to swing the door;

(h) sensing means for sensing a body accessing the door to thereby provide an electric signal to the control means to energize the motor to open the swing door; and

(i) detecting means for detecting an open angle degree of the swing door, the detecting means including:

a program cam operatively connected to the drive shaft for being rotated; and

a photo detector for detecting the shape of the program cam to thereby provide an open angle degree signal to the control means for controlling the rotation of the motor.

4,501,091

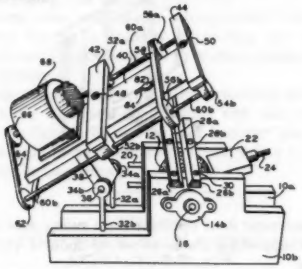
APPARATUS FOR PREPARING AN OPTICAL WORKPIECE

Wayne R. Ignatuk, Morris Plains, and Frank M. Plocic, Bridgewater, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Sep. 24, 1982, Ser. No. 422,818

Int. Cl.³ B24B *9/14*

U.S. Cl. 51—102 **12 Claims**



1. Apparatus for preparing an optical workpiece comprising:

an abrasive cylindrical drum for shaping a portion of said workpiece;

a pair of adjustably-mounted, elongated complementary guides mounted proximate to and extending alongside said abrasive cylindrical drum, said guides being sized and adjustably spaced to allow said workpiece to span said guides and roll upon them; and

drive means mounted alongside said guides for rolling said workpiece on said guides, said drive means being comprised of an endless belt mounted to circulate along a path with a portion of said path being parallel to said guides, said guides being positioned between said drive means and said abrasive cylindrical drum, said workpiece being positionable between said drive means and guides to protrude beyond said guides and reach said abrasive cylindrical drum.

4,501,092

AUTOMATIC GRINDING

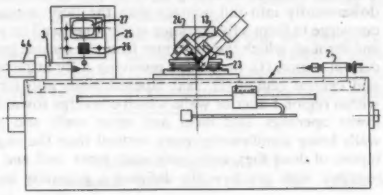
Ronald L. Archibald, Bushey, England, assignor to Staveley Machine Tools Limited, London, England

Filed Sep. 14, 1982, Ser. No. 417,840

Claims priority, application United Kingdom, Sep. 15, 1981, 8127827

Int. Cl.³ B24B *49/00*

U.S. Cl. 51—165 R **6 Claims**



1. A machine for automatically performing grinding operations at predetermined locations along a workpiece comprising: an elongated fixed bed provided with means to receive and secure the workpiece to said bed against axial displacement relative to said bed, a sensing and grinding assembly mounted on said bed, said assembly including a first member mounted to be movable longitudinally relative to said bed, a second member mounted on said first member to be movable in a substantially vertical direction relative to said first member, a third member mounted on said second member to be transversely shiftable relative to both said second member and to said bed, a work head pivotally mounted on said third member to be rotatable relative to said third member about a substantially horizontal axis, a sensing probe and a grinding tool mounted in spaced relation on said work head, a central control unit including a micro-processor for controlling the operation of the individual elements of said sensing and grinding assembly in accordance with operating instructions and sensed information recorded in said control unit, means activated by said control unit for moving said sensing and grinding assembly in one direction along the entire length of the workpiece secured to said bed,, means operating said sensing probe during movement of said assembly in said one direction to sense and record in said control unit each location at which grinding is to be performed, means activated by said control unit for moving said sensing and grinding assembly along said workpiece in the opposite direction, and means operating said grinding tool during movement of said assembly in said opposite direction to effect the required degree of grinding at each recorded location sensed by sensing probe during movement in said one direction.

4,501,093

PROFILE MACHINING APPARATUS

Allan J. Fisher, Cambridge, England, assignor to The Newall Engineering Company Limited, Peterborough, England

Filed Dec. 13, 1982, Ser. No. 449,565

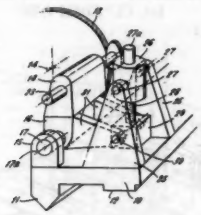
Claims priority, application United Kingdom, Jun. 21, 1982, 8217890

Int. Cl.³ B29B *49/00*

U.S. Cl. 51—165.71 **14 Claims**

1. A profile forming apparatus comprising means for rotatably mounting a workpiece while the profile is to be formed thereon, means for rotating the workpiece at a speed controlled by a predetermined programme, a rotary machine tool for removing stock from a portion of the workpiece held by the mounting means, the machine tool being rotatable about an axis parallel to the axis of rotation of the workpiece, a work table for supporting said mounting means for rocking movement about an axis parallel to the axis of rotation of the workpiece, means to feed the machine tool at a predetermined rate

and by a predetermined distance to remove a required amount of stock from the workpiece and drive means for rocking the workpiece mounting means in accordance with the predetermined programme to determine the dimensions and shape of the profile to be machined on the workpiece by the machine tool, wherein the improvement comprises lever means provided on said workpiece mounting means extending transversely to the axis of rocking movement thereof for connection to said drive means, the drive means comprising a high torque



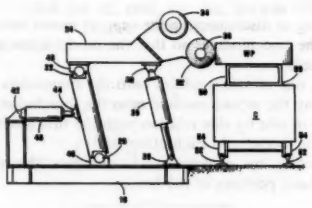
low inertia reversible electric drive motor, mounting means on the work table for supporting the drive motor, trunnion means for mounting the drive motor in said motor mounting means to tilt about an axis parallel to the axis of rocking of the workpiece mounting means, the drive motor having a ball screw means output shaft and a nut in which the ball screw means engages and further trunnion means pivotably connected to said lever means to tilt about an axis parallel to the rocking axis of the workpiece mounting means.

4,501,094

WORKPIECE PROFILE-FOLLOWING CONTROL SYSTEM FOR CONDITIONING GRINDERS

John P. Veale, Snohomish County, Wash., assignor to Western Gear Machinery Co., Everett, Wash.

Filed Nov. 22, 1982, Ser. No. 443,168
Int. Cl.³ B24B 7/02
U.S. Cl. 51—165.71 **6 Claims**



1. A control system for a conditioner grinder for grinding elongated workpieces, said system comprising:

actuator means for moving said grinding wheel in a first direction normal to a surface of the workpiece to be ground and in a second direction parallel to the surface to be ground and perpendicular to the longitudinal axis of the workpiece;

first transducer means for measuring an operating parameter of said grinding wheel;

first control means receiving an output from said first transducer means for controlling said actuator means to maintain said operating parameter at a predetermined value;

workpiece manipulation means for reciprocatingly moving said workpiece along its longitudinal axis with respect to said grinding wheel during a plurality of grinding passes;

gauging means for determining the curvature of said workpiece about an axis perpendicular to the surface of said workpiece being ground and for generating a signal indicative of the curvature-induced offset of said workpiece at a location on said workpiece adjacent said grinding wheel as said workpiece longitudinally moves with respect to said grinding wheel during each grinding pass; and

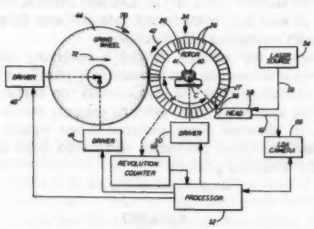
second control means receiving the curvature indication from said gauging means for controlling said actuator means to move said grinding wheel in said second direction by an amount corresponding to said curvature indicative signal, thereby compensating for any curvature in said workpiece about an axis normal to the surface of said workpiece being ground.

4,501,095

METHOD AND APPARATUS FOR GRINDING TURBINE ENGINE ROTOR ASSEMBLIES USING DYNAMIC OPTICAL MEASUREMENT SYSTEM

William H. Drinkuth, Amston; Robert J. Bires, Glastonbury; Robert J. Miller, Vernon, and Franklin G. Selleck, Portland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 7, 1983, Ser. No. 501,982
Int. Cl.³ B24B 49/12
U.S. Cl. 51—165.72 **12 Claims**



1. Apparatus from machining the tips of blades in a rotor assembly having removable spaced apart blades radially mounted around the periphery of a disk comprised of:

(a) support means for holding a rotor assembly comprised of a disk and a plurality of removable blades along an axis of a machine base and for rotating the assembly thereabout in a first direction at a speed of at least 1000 rpm, to cause each spaced apart blade tip to move along a circumferential path with a tangential velocity of at least 25 m/s;

(b) machining means for progressively removing material from the blade tips at a first circumferential path location while the blade tips are moving past the location with said velocity, to thereby change the length of the blades;

(c) gaging means for measuring, at a second circumferential path location spaced apart from said first location, the radial position with respect to said axis of each of the individual blade tips as material is being removed from the rotating blade tips by the machining means and as blade tips pass by the second path location with an interval time of less than 0.004 seconds, the gaging means providing a blade length signal for each of the individual blade tips;

(d) means for identifying each blade on the rotating assembly, the means providing an angular position signal; and

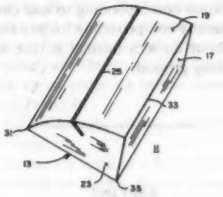
(e) a processor responsive to the blade length signals and the angular position signal, for providing a blade length reading for each identified blade in the rotor assembly while it is being machined, and for controlling the rate at which material is removed from the tips by said machining means, to enable machining of the tips of the blades to a desired radial position.

4,501,096

HAND-HELD SANDING DEVICE

Sergei G. Lukianoff, 1049 Folger Ave., Berkeley, Calif. 94701

Filed Dec. 30, 1982, Ser. No. 454,608
Int. Cl.³ B24D 15/00
U.S. Cl. 51—391 12 Claims



1. A hand-held sanding device for use with sandpaper or other abrasive sheet material, comprising

a resilient block having three laterally extending intersecting block faces forming block perimeter surfaces about which said abrasive sheet material can be wrapped, and two end surfaces defining the length of said block, said three intersecting block faces consisting of one substantially flat bottom surface, one substantially flat side surface substantially perpendicular to said bottom surface, and one top surface extending in a single convex curvature from said bottom surface upwardly to said side surface, the intersection of said top, bottom and side surfaces forming three laterally extending block corners,

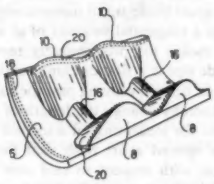
said curved top surface having a receiving slot formed therein intermediate and substantially parallel to the laterally extending edges of said curved top surface, said receiving slot being of a width to snuggly receive the two ends of abrasive sheet material when tightly wrapped around the block perimeter surface to hold same in its tightly wrapped position.

4,501,097

RIDGE ELEMENT FOR CORRUGATED ROOFS

Johannes Rosenkilde, Gröddevej 12, Ikast, Denmark

PCT No. PCT/DK81/00090, § 371 Date Jun. 21, 1982, § 102(e) Date Jun. 21, 1982
PCT Filed Oct. 20, 1981, Ser. No. 395,042
Claims priority, application Denmark, Oct. 21, 1980, 4444/80
Int. Cl.³ E04D 1/36
U.S. Cl. 52—57 6 Claims



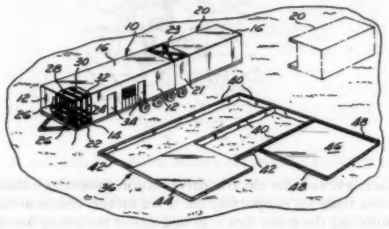
1. A ridge element for corrugated roofings bridging a top gap between opposed inclined roof portions, said ridge element having a substantially smooth arched shell portion having on a concave underside opposed wing portions profiled so as to be generally engageable with standard corrugations of the roofing, characterized in that the ridge element is a rigid monolithic member, the opposed wing portions are provided along respective outer longitudinal edges with downwardly projecting flange portions, lower edges of said projecting flange portions are shaped to accommodate, in use, a standard corrugation of the roofing when a ridge angle is between 90° and 140°, said flange portions are constituted by outer end portions of partly cylindrical protrusions on the underside of the ridge element, a generator direction of the protrusions of the opposed wing portions forming an angle with each other which is between 45° and 90°.

4,501,098

HYBRID HOME CONSTRUCTION TECHNIQUE

James H. Gregory, Irvine, Calif., assignor to Heritage Homes, Inc., Ridgecrest, Calif.

Filed Jul. 19, 1982, Ser. No. 399,906
Int. Cl.³ E04H 1/00
U.S. Cl. 52—79.1 3 Claims



1. A method of building a house comprising:

constructing a pair of house modules in a factory, said modules each having a generally rectangular shape and one or more rooms as well as substantially all the mechanical and electrical systems for the house, said modules being constructed in end to end aligned relation with their adjacent end walls being spaced from each other to provide a work area during construction and with structural support means interconnecting the two modules so that they may be shipped as a single unit;

constructing a foundation at a building site for the house including a matrix of footings conventionally constructed in position to provide supporting surfaces for receiving the modules as well as adjacent structures of the house;

transporting the module unit on a single trailer to the building site;

removing or disconnecting the support means interconnecting the two modules so that the modules are separately movable;

moving one of said modules onto the foundation and then moving the second module onto the foundation positioning it in side by side relation with the first module;

fixing the modules to each other; and

constructing by conventional techniques the remaining structural portions of the house.

4,501,099

STRUCTURE FOR A MODULAR GREENHOUSE AND THE LIKE

Premakaran T. Boaz, 16842 Yorkshire, Livonia, Mich. 48154

Filed Jul. 26, 1982, Ser. No. 402,027
Int. Cl.³ E04B 7/00
U.S. Cl. 52—82 6 Claims

1. A modular building having a hexagonal shape comprising:

six vertical supports having a Y-shaped cross-section formed from three legs equally spaced from each other;

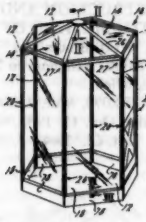
a first leg of each support forming an adhering surface for a panel of one side of the building;

a second leg of each support forming an adhering surface for a panel of an adjacent side of the building;

a third leg extending outward from the center of the building and forming an adhering surface for a panel;

a panel being adhered to said first and second legs of two consecutive supports respectively forming a respective wall of the building;

six roof supports connected together at their inner ends and radially extending outwardly therefrom;
said roof supports having their outer ends in proximity to said first and second legs of said vertical supports;
six horizontal supports having first and second flanges extending substantially at right angles to each other;
said horizontal supports each having end sections where said first and second flanges are offset inwardly a thickness of said legs of said vertical support and a thickness of said roof support respectively and abutting inside surfaces of



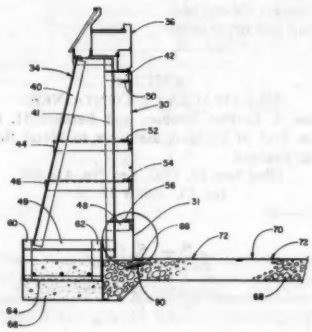
said respective leg and roof support such that outside surfaces of said leg and said first flange of said horizontal support are substantially coplaner at a sealing area defined thereon and the outside surfaces of said roof support and said second flange of said horizontal support are substantially aligned at a sealing area defined thereon;
said legs of said vertical supports and said first flanges of said horizontal supports at said defined sealing area being constructed to adheringly support a set of glass panes; and
said roof supports being constructed to adheringly support a second set of glass panes.

4,501,100

METHOD AND APPARATUS FOR MAKING SWIMMING POOLS

John F. Corna, Columbus, and Marcel H. Blais, Westerville, both of Ohio, assignors to Statewide Pools, Inc., Columbus, Ohio

Filed Jul. 16, 1982, Ser. No. 398,949
Int. Cl.³ E04H *3/18*
U.S. Cl. 52—169.7 **21 Claims**



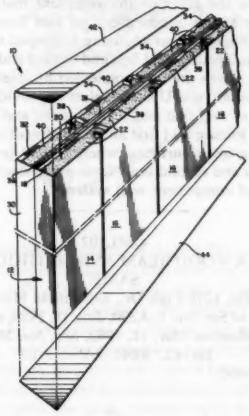
13. For use in fabricating a swimming pool, a universal bottom wall panel module adapted to interfit with a plurality of like panels comprising: a rectangular sheet having a first pair of intersecting edges formed to provide offsets and underlap flanges, and having a second pair of intersecting edges having overlap flanges, whereby said panel modules are adapted to be positioned in tandem to form rows and with said rows being in parallel relationship with each other, wherein the overlap flanges of one panel module are adapted to overlap the underlap flanges of an adjacent panel module to form a mosaic bottom for a swimming pool.

4,501,101

FIRE RATED COMPONENT WALL SYSTEM

Alan H. Davis, Vernon, Tex., assignor to Combined America Industries, Inc., Dallas, Tex.

Filed Nov. 4, 1982, Ser. No. 439,315
Int. Cl.³ E04B *1/74*
U.S. Cl. 52—404 **9 Claims**



1. A fire rated component wall system, comprising:
a first parallelepiped shaped wall unit having one elongated major surface as an outer surface and a second opposite major surface as an inner surface, said outer surface being formed from interlocking steel panels including means for supporting said inner surface a predetermined distance from said outer surface to define a plurality of compartments therebetween, and said inner surface being formed from a layer of fire retardant material;
a second parallelepiped shaped wall unit having one elongated major surface as an outer surface and a second opposite major surface as an inner surface, said outer surface being formed from interlocking steel panels including means for supporting said inner surface a predetermined distance from said outer surface to define a plurality of compartments therebetween, and said inner surface being formed from a layer of fire retardant material;
said interlocking steel panels further including
a first end panel having a first front planar panel section extending to an inwardly projecting slot having first and second elongated sides extending inwardly, said second side being a predetermined distance shorter than said first side, a second front panel section parallel to and recessed from said first panel section a predetermined distance as determined by said second side of said slot, a rib projecting inwardly and normally from said second front panel section, and an end panel section extending from the opposite end of said first front panel section, said end panel section extending a predetermined distance beyond said rib as determined by the thickness of said layer of fire retardant material;
at least one interior panel having a first planar front panel section, an insert member forming one end of said panel and projecting inwardly to said inner surface, a generally U-shaped slot at the opposite end of said front panel section, said slot having first and second elongated sides extending inwardly, said second side being a predeter-

mined distance shorter than said first member, a second planar front panel section parallel to and recessed from said first front panel section and recessed a predetermined distance as determined by the length of said second elongated side of said slot, and a rib projecting inwardly and normally from said recessed panel section as the other end of said panel, said rib supporting said interior layer of fire retardant material; and

a second end panel having a front planar surface, an end section extending from one end of said end panel and projecting inwardly a predetermined distance beyond the rib supporting member of said interior panel to cover the width of the layer of fire retardant material, the insert member at the opposite end of said front panel section interlocking with an adjoining U-shaped slot of said interior panel section, said first and second end panels and said interior panels are interconnected by inserting said insert members into said U-shaped slots to provide a planar outer surface of said first and second units; and

means for joining said first and second wall units along their opposing inner surfaces, whereby said outer surfaces of said first and second units form outer steel surfaces of the fire rated component wall system.

4,501,102

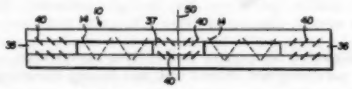
COMPOSITE WOOD BEAM AND METHOD OF MAKING SAME

James Knowles, 1275 Club Dr., Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 113,370, Jan. 18, 1980, abandoned. This application Mar. 11, 1982, Ser. No. 356,997

Int. Cl.³ E04C *3/292, 3/02*

U.S. Cl. 52—690 **8 Claims**



1. In a composite beam formed of a pair of vertically spaced apart, elongated wood chords which are interconnected along their lengths, and with an elongated wood filler strip spanning and filling the space between and fastened to the chords, the elongated wood chords and elongated wood filler strip each having elongated faces and elongated edges and with the elongated edges of the strip being parallel to and in contact with elongated edges of the adjacent chords, and with the beam being formed to support a predetermined load having longitudinal and normal force components relative to the chords, the improvement comprising:

the wood strip being fastened to both of the chords by means of a number of elongated generally plate-like mechanical fasteners, each of which is embedded substantially equally into the faces of the wood strip and a chord for joining together adjacent portions of both the wood strip and a chord;

each said fastener being arranged at an acute angle from the vertical so that each fastener slopes upwardly and toward its nearest beam end for placing the fastener under tension under the application of downwardly directed loads upon the beam, whereby the fastener resists the tendency of the chords and strip to separate, but rather tends to compress together corresponding chord and wood strip elongated edge portions under such beam load and consequently maintains substantial frictional contact between adjacent contacting chord and strip elongated edges for absorption of part of the longitudinally directed shear force components of the applied beam load, and for increasing the load bearing capacity of the beam; and

wherein said wood strip is located over the portion of the beam where the direction of the longitudinal force component changes, so that one part of the length of the wood strip overlaps chord portions having longitudinal shear force components of one direction, and the opposite part of the length of the wood strip overlaps chord portions having their longitudinal shear force components oppositely directed, and with the fasteners on opposite sides of the location where the force direction changes being correspondingly angled upwardly toward their nearest beam end so that the fasteners are all ordinarily under tension when the beam is loaded, regardless of the two different longitudinal shear force component directions.

4,501,103

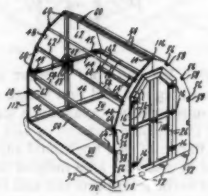
BUILDING CONSTRUCTION AND PURLIN HANGER THEREFOR WITH METHOD OF CONSTRUCTION

Dennis P. Markey, West Bloomfield, and George J. Rosen, Franklin, both of Mich., assignors to Marco Wood Products, Inc., Walled Lake, Mich.

Division of Ser. No. 360,078, Mar. 3, 1982, Pat. No. 4,425,742. This application Oct. 11, 1983, Ser. No. 540,770

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—745 **2 Claims**



1. A method for constructing a storage hut comprising front and rear walls, each said wall having an interior surface and an exterior surface, purlins, hanger means to attach said purlins to said walls, said hanger means including means for attachment to the exterior surface of one of said walls, floor means, means for locating said walls on said floor means, means for attaching said walls to said floor means, and brace means for bracing said walls to said floor, which comprises the steps of:

preparing the floor means;

attaching the walls to the floor and bracing the walls by connecting said brace means between the floor means and each wall;

attaching hanger means to each end of said purlins:

attaching said purlins to the exterior surfaces of said walls by said hanger means; and

removing said brace means.

4,501,104

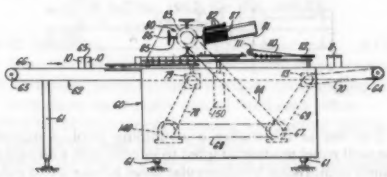
MULTIPACKS OF CONTAINERS

Christopher J. Griffin, London, and Bernard H. Oxbrow, Swindon, both of England, assignors to Metal Box, P.L.C., Reading, England

Filed Sep. 10, 1982, Ser. No. 416,491

Int. Cl.³ B65B *27/04*

U.S. Cl. 53—48 **7 Claims**



1. Apparatus for attaching blanks of a heat-sealable sheet material to multipacks each comprising a plurality of containers in an array and a sheet plastics coupler having apertures

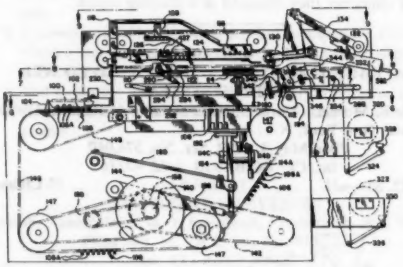
through which end closures of the containers project and which are dimensioned so that the containers are tightly held by tension in the coupler material, each blank having a plane portion by which it overlies and substantially covers the end closures of a said multipack and a plurality of tabs integrally joined to the plane portion along two opposed sides thereof and foldable downwardly in relation to the plane portion to heat sealed connection with the coupler along opposed sides of the multipack, the apparatus comprising conveyor means for transporting a succession of said multipacks along a generally horizontal path, a reservoir for plurality of said blanks, applicator means operating in timed relation to said conveyor means to place blanks individually upon said multipacks moving along said conveyor means with the tabs of said blanks disposed laterally in relation to the conveyor path and, along each side of the conveyor path, heating means for directing hot gas onto said tabs and onto the lateral surfaces of said coupler whereby to render them heat-sealable together, folding means for folding the tabs downwardly adjacent said lateral surfaces of the coupler, and pressure means for holding the tabs against the coupler to heat-seal the same together, said conveyor means comprising a locating side conveyor disposed to receive the multipacks wit the blanks thereon downstream of the applicator means and having dog members arranged to engage individual multipacks between adjacent containers within said individual multipacks, so as to locate the multipacks as they are carried in substantially continuous succession through the heating means, folding means and pressure means, each dog of the locating side conveyor being arranged to engage both a multipack and the respective blank thereon so as to locate the blank in relation to the multipack until the heat-seals have been made.

4,501,105

FILM SUPPLY MONITOR FOR FILM WRAPPING MACHINE

Robert M. Rogers, Troy; Fritz F. Treiber, Centerville, and Russell E. Bowers, Trotwood, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,682
Int. Cl.³ B65B *59/02*
U.S. Cl. 53—64 **2 Claims**



1. In a film wrapping machine including means for drawing a section of stretchable film from a continuous supply of said film into said machine, said film being threaded over a tensioning roller prior to being drawn into said machine such that said tensioning roller maintains a substantially constant force on said film and is displaced by a defined amount upon draw of a minimum length of film into said machine, an improved machine control system comprising:

sensing means coupled to said tensioning roller for detecting said defined amount of displacement caused by film being drawn into said machine and for generating a signal indicating such film draw; and

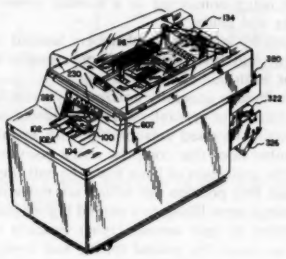
interruption means for stopping the operation of said machine upon failure to receive said signal.

4,501,106

WRAPPING CONTROL SYSTEM FOR FILM WRAPPING MACHINE

Fritz F. Treiber, Centerville, and Russell E. Bowers, Trotwood, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,681
Int. Cl.³ B65B *59/02*
U.S. Cl. 53—66 **9 Claims**



1. In a film wrapping machine including film gripper means for pulling a section of stretchable film from one of at least two different width rolls of film to a position for wrapping a package, clamping means for engaging the opposite sides of said section of film for stretching said film section prior to wrapping a package, and folding means for wrapping said section of film about a package, an improved control system comprising:

first film selection means for automatically selecting one of said film widths for each package to be wrapped in response to signals identifying size characteristics of each package;

package sensing means for generating said size characteristic identifying signals; and

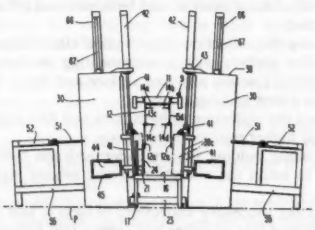
timing means for synchronizing the film gripper means and the clamping means with the folding means dependent upon the film width selected whereby the film tension control during package wrapping is individualized for each film width selected by said film wrapping machine.

4,501,107

BATT STACKER AND LOADER AND METHOD THEREFOR

Tony S. Piotrowski, Prairie Village, Kans., assignor to Certain-Teed Corporation, Valley Forge, Pa.

Filed Dec. 29, 1982, Ser. No. 454,422
Int. Cl.³ B65B *1/24*
U.S. Cl. 53—438 **17 Claims**



13. In an improved apparatus for removing insulation batts from a delivery zone of a production line or the like by collecting and stacking the batts, transferring the stacks, compressing the stacks into a smaller volume and moving the smaller volume to a container, the improvement comprising:

(a) a first surface located below the delivery zone for receiving batts therefrom;

(b) a batt transfer device for engaging batts and moving collections of batts generally horizontally from and to opposite lateral sides of said first surface and having generally vertically disposed batt engaging means for contacting the batts that include guides projecting through a plurality of laterally running slots in said first surface, said guides being connected to a transfer power means for moving said guide;

(c) a plurality of packing chambers located immediately adjacent said first surface and on opposite lateral sides thereof, each said chamber having

(i) at its base, a generally horizontally extending floor,

(ii) a plurality of generally horizontal lifting members in a normally recessed relationship with openings in said chamber floor that comprise a first position for receiving the collection of batts from the batt transfer device at said first position but which are movable from said openings upon lifting to a second higher position, being powered to said second higher position by a lifting power means for guided raising and lowering of said lifting members,

(iii) generally vertically disposed wall surfaces extending around said floor and holding fingers extendingly disposed through an aperture in a said wall into said chamber in a horizontal direction at said second higher position to removably retain the collection of batts while said lifting members lower to said first position, said fingers being connected to a finger-moving power means for back and forth movement,

(iv) a vertically movable horizontally disposed plate mounted for movement from the upper end of said chamber with plate drive power source connected thereto for forcing said plate into the collection of batts against said chamber floor thereby comprising a smaller unit, and

(v) a snout extending outwardly from an aperture in said chamber wall adjacent said floor comprising means for removably receiving a container applied thereto, a horizontally extendable ram inwardly of and adjacent to an aperture in said chamber wall and opposite of said wall having the snout and aperture, and ram power means for moving said ram in a pushing relation to the unit from said back wall aperture, through said aperture and snout and into the container.

14. A method for receiving a plurality of insulation batts from delivery zone of a production line or the like by collecting the batts into stacks, transferring the stacks into one of a plurality of bagging chambers, retaining the stacks while other stacks are transferred in, compressing all stacks and transferring the compressed unit of insulation batts into a container, comprising the steps of:

(a) collecting and stacking the batts on a first surface having opposite, lateral sides as said batts proceed off a production line;

(b) moving the collection of batts off of either lateral side of said first surface with a reciprocating motion directed horizontally across said first surface and into a first position in a first packing chamber;

(c) raising the collection of batts from said first position to a second higher position thereabove;

(d) extending holding fingers underneath the collection of batts to retain the collection in said second higher position;

(e) receiving successive collections of batts in said first position in said first chamber and raising said successive collections up to said second higher position;

(f) retracting and extending said holding fingers to retain the successive collections of batts in said second higher position;

(g) compressing the collections of batts in said chamber into a smaller volume;

(h) transferring a collection of batts by said batt transfer device into a second bagging chamber for stacking and compressing therein; and

(i) removing the smaller volume of compressed batts from the inside of said first chamber into a waiting container.

4,501,108

METHOD OF SEALING A TUBULAR RECEPTACLE

Arne Johansson, Roskilde, Denmark, assignor to A/S Nunc, Roskilde, Denmark

Filed Mar. 22, 1982, Ser. No. 360,843
Claims priority, application Denmark, Mar. 25, 1981, 1352/81
Int. Cl.³ B65B *53/02, 63/08*
U.S. Cl. 53—440 **2 Claims**

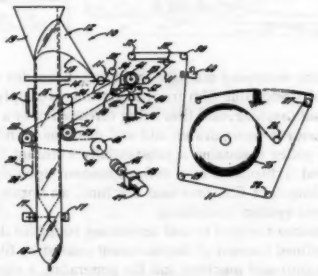
1. A method of freezing a sample of a biological material comprising introducing said sample into a cylindrical container made from a plastic material and having a removable lid; inserting said container in a preformed tubular body made from a heat-shrinkable material, said tubular body having a length greater than that of the cylindrical container; heating the tubular body to a temperature sufficiently high to cause the heat-shrinkable material thereof to shrink; compressing the tubular body in zones adjacent to the ends of the container to cause the tubular body to melt together in said zones; and inserting the sealed container thus obtained in a freezing liquid.

4,501,109

PACKAGING MACHINE WITH IMPROVED WEB FEEDING SYSTEM

Claude E. Monsees, Durham, N.C., assignor to Rexham Corporation, New York, N.Y.

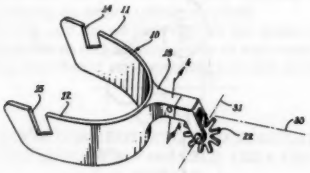
Filed May 3, 1982, Ser. No. 374,040
Int. Cl.³ B65B *9/10, 9/12, 41/16*
U.S. Cl. 53—451 **15 Claims**



1. A machine for forming, filling and sealing packages, said machine being of the type in which a web of flexible material

is pulled from a supply and past means for forming the web into tubing, in which product to be packaged is delivered into the tubing, and in which sealing operations are performed on the tubing to form packages, said machine comprising pay off means located between said supply and said forming means for pulling said web from said supply, pull down means located downstream of said forming means and acting on said tubing to pull said web past said forming means, means for driving said pull down means at a linear speed which is effective to pull a predetermined length of web past said forming means in a predetermined time interval, means for driving said pay off means for the same time interval as said pull down means and at a linear speed which is greater than the linear speed of said pull down means, and means for sensing the tension of said web at a location between said pay off means and said forming means and for causing said pay off means to slip relative to said web as an inverse function of said tension.

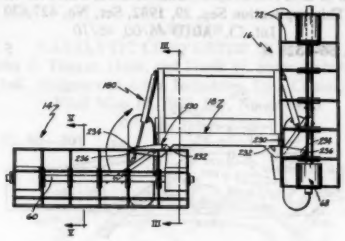
4,501,110
RIDING SPURS
Charles E. Kibler, 12051 N. Ranch La., Scottsdale, Ariz. 85260
Filed Mar. 14, 1984, Ser. No. 589,344
Int. Cl.³ A43C *17/00*
U.S. Cl. 54—83 R **9 Claims**



1. In a spur having a body attachable to a rider's foot, the improvement comprising:
   a. a shank extending from said body rearwardly of the rider's foot;
   b. a rowel mounting member freely rotatably secured to said shank for rotation, during use of said spur, about a first axis;
   c. a rowel rotatably mounted on said member for rotation about a second axis perpendicular to the axis of rotation of said mounting member;
   d. said mounting member and rowel freely rotating as a unit about said first axis when said spur contacts the side of an animal.

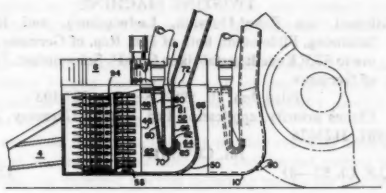
4,501,111
CRANBERRY HARVESTER
Lee W. Abbott, Box No. 1, Speedwell, Chatsworth, N.J. 08019
Filed Sep. 16, 1982, Ser. No. 418,723
Int. Cl.³ A01D *46/28*
U.S. Cl. 56—8 **29 Claims**

1. A wet harvesting apparatus to remove fruit from a bed of vines, said harvesting apparatus comprising:
   a wheeled chassis;
   a reel support frame having a base and a pair of legs;
   mounting means operatively connected between said support frame and said chassis for mounting said frame to said chassis so that said frame may tilt and move vertically to conform to the surface of the bed;
   a harvesting reel rotatably supported from the legs of said support frame;
   drive means connected to said reel for rotating said reel to remove fruit from the vines; and
   reel lift means connected to said support frame for raising said reel for cleaning purposes and for over-road travel, said reel lift means including a pivot arm extending from said chassis and having an end defining a pivot point



positioned to contact said base of said support frame as said reel is raised.

4,501,112
COTTON HARVESTING MACHINE PNEUMATIC DUCT SYSTEM
Guy N. Thedford; Robert M. Fachini, both of Naperville, and Dennis K. Sullivan, Elmhurst, all of Ill., assignors to International Harvester Co., Chicago, Ill.
Filed Jun. 27, 1984, Ser. No. 625,474
Int. Cl.³ A01D *45/18*
U.S. Cl. 56—13.3 **10 Claims**

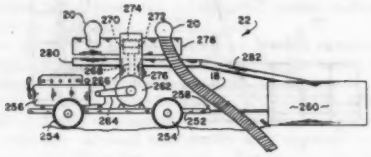


1. A cotton harvesting machine with a duct system for pneumatically transporting cotton from a harvesting means to a conveyor tube comprising:
   a duct having an inlet port generally exposed to the harvesting means for receiving cotton from said harvesting means, said duct being U-shaped, and said duct including:
   a descending leg, said descending leg having a wall generally opposite said duct inlet port and said descending leg having an outlet generally located at its lower end;
   an elbow for receiving cotton from said descending leg outlet and said elbow having an upper and lower wall and said elbow redirecting the cotton to an outlet in a generally upward direction;
   an ascending leg receiving cotton from said elbow outlet, said ascending leg having front and rear walls and said ascending leg having an outlet generally in the upward direction aligned with the conveyor tube; and
   a U-shaped air supply line, said air supply line being adjacent said descending leg rear wall and said elbow upper wall, said air supply line having a nozzle outlet adjacent the forward side of said ascending leg, said nozzle outlet directing an air flow in a generally upward direction.

4,501,113
FRUIT HARVESTING MACHINE

Curtis E. Gerber, 4015 Bayshore Blvd., 8C, Tampa, Fla. 33611

Division of Ser. No. 271,943, Jun. 9, 1981, Pat. No. 4,388,798.
This application Sep. 29, 1982, Ser. No. 427,630
Int. Cl.³ A01D *46/00, 46/10*
U.S. Cl. 56—328 R 5 Claims

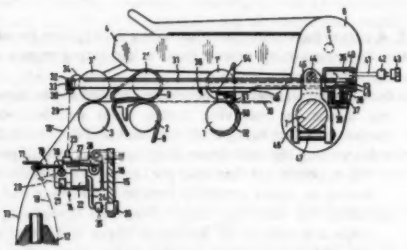


1. A transport for a fruit harvesting machine, comprising in combination:
a frame;
means for connecting the vacuum source of the fruit harvesting machine to said frame;
a housing connected to the vacuum source;
an input conduit of the said vacuum source extending into said housing;
filter means connected about said input conduit for filtering fluid passing towards said vacuum source;
a manifold connected to said housing; and
means for connecting at least one of the discharge valves of the fruit harvesting machine to said manifold such that said discharge valve is connected in fluid communication with the vacuum source.

4,501,114
APPARATUS FOR CONTROLLING PASSAGE OF MATERIAL THROUGH TEXTILE SPINNING OR TWISTING MACHINE

Michael von Ronai-Horvath, Ludwigsburg, and Bernhard Schönung, Filderstadt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,193
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123476
Int. Cl.³ D01H *13/16*
U.S. Cl. 57—81 13 Claims

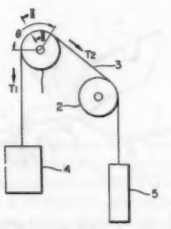


1. Apparatus for regulating the passage of moving material through a textile spinning machine or the like comprising a first assembly having means operable for controlling the entry of said material into said machine, a second assembly located downstream from said first assembly for determining the continuity of said material moving through said machine comprising means for impinging a light source on said material, means for sensing the light reflected from said moving material and for converting said reflected light into an electrical signal of alternating intensity, means for modulating said alternating intensity electrical signal, and light emitting means responsive to said modulated alternating intensity electrical signal for emitting a modulated light beam, and a third assembly for producing a command signal for operating said control means comprising a receiver for said modulated light beam spaced remotely from and arranged in line of sight with said light emitting means providing an electrical output and means for converting said electrical output into an alternating voltage comprising an amplifier receiving the output of said receiver, and an identification circuit responsive to said amplifier for rectifying the output signal and a pulse generator providing a pulse for operating said means for controlling the entry of said material.

4,501,115
TRACTION TYPE ELEVATOR SYSTEM

Katsuhiko Suzuki, Nagoya, and Seihachi Naganuma, Kawasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha; Tokyo Rope Mfg., Co., Ltd. and Hakko Kouyu Co., Ltd., all of Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,704
Claims priority, application Japan, Apr. 12, 1982, 57-60485
Int. Cl.³ D02G *3/36, 3/06;* C09K *3/14*
U.S. Cl. 57—220 19 Claims



1. A traction type elevator system comprising a wire rope place around a drive sheave including a soft-solid or greasy agent coated on the wire rope which increases the coefficient of friction or traction between the wire rope and the drive sheave, said agent having a drip point higher than 55 degrees C. and a rate of evaporation of less than 1 weight percent at 105 degrees C. during an interval of eight hours and being comprised of a thickener in an amount sufficient to provide said drip point and a suitable viscosity and at least one of a polybutene or a liquid polyisobutylene as a basic constituent.

4,501,116
PROCESS FOR WINDING A NEWLY JOINED THREAD ONTO A TUBE NEWLY INSERTED IN A SPOOLING DEVICE

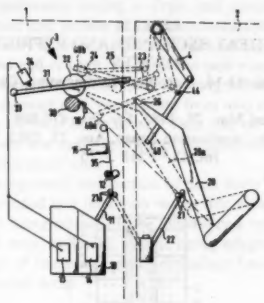
Edmund Schuller; Walter Mayer, both of Ingolstadt; Eugen Hini, Lenting; Erich Bock, Wettstetten, and Kurt Lovas, Bohmfeld, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,278
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123494
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—263 6 Claims

1. A process for exchanging a full bobbin for a empty tube in a spooling device on an open-end spinning mechanism, wherein on reaching the desired spool size the open-end spinning mechanism is stopped and its fiber collecting surface is cleaned, said process comprising the following steps:
cleaning said fiber collecting surface of the open-end spinning mechanism after a thread break;
returning the thread from said full bobbin to the open-end

spinning mechanism after said cleaning of the spinning mechanism and effecting a thread-joining operation;

withdrawing the thread from said open-end spinning mechanism after said thread-joining and guiding the joined thread away together with the thread join by means of a suction device;



severing a thread section extending from the suction device to said full bobbin;

removing said full bobbin from said spooling device and exchanging an empty tube in its place;

transferring said thread delivered by the open-end spinning mechanism to said suction device to said empty tube; and

severing said thread end extending into said suction device.

4,501,117

DEVICE FOR CONTROLLING AND REGULATING THE CROSS SECTION OF A VARIABLE AREA PROPULSIVE NOZZLE

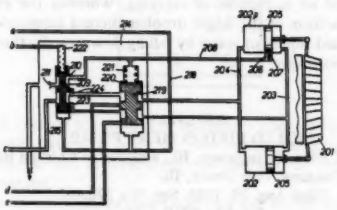
Guy M. C. Canivet, Boissise le Roi, France, assignor to Societe Nationale d'Etude de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 16, 1983, Ser. No. 552,383

Claims priority, application France, Nov. 29, 1982, 82 19949

Int. Cl.³ F02K *1/17*

U.S. Cl. 60—235 **15 Claims**



1. In an aircraft turbojet engine having a variable area propulsive nozzle, first supply means to supply fuel to the engine under normal operating conditions, second supply means to supply fuel to the engine under emergency operating conditions in case of failure or malfunction of the first supply means, switching means movable between first and second positions to switch the fuel supply from the first supply means to the second supply means and hydraulic cylinder means including a piston and a rod connected to movable flaps so as to vary the cross sectional area of the propulsive nozzle, the improved apparatus for controlling the operation of the variable nozzle comprising: (a) means to direct an actuating fluid into the hydraulic cylinder means when the switching means is moved into the second position such that the cross sectional area of the propulsive nozzle is reduced; and, (b) orifice means associated with at least one of the hydraulic cylinders to limit the travel of the piston in the cylinder thereby limiting the amount of reduction of the nozzle area so as to prevent overloading the compressor of the turbojet engine.

4,501,118

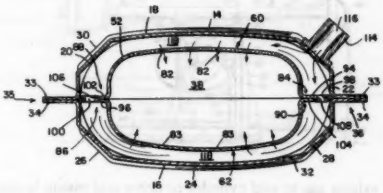
CATALYTIC CONVERTER HOUSING

Timothy Z. Thayer, Hope, and Frank W. Shaw, Columbus, both of Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed May 16, 1983, Ser. No. 494,611

Int. Cl.³ F01N *3/28*

U.S. Cl. 60—301 **10 Claims**



1. In a catalytic converter having a longitudinally disposed body portion comprising first and second shell halves having a wall defining an interior through which a combustion product can flow, the body having an inlet through which the combustion product can flow into the interior of the body and an outlet through which the combustion product can flow out of the interior of the body,

a reducing catalyst disposed in the interior of the body proximal to the inlet,

an oxidizing catalyst disposed in the interior of the body proximal to the outlet, and

means for providing a passageway between the body interior containing the reducing catalyst and the body interior containing the oxidizing catalyst, the improvement comprising first and second manifold halves, each half including

a pair of flanges extending perimetrally substantially completely around the interior wall of one shell half, the manifold flanges being disposed substantially parallel to the interior wall and coupled thereto,

the manifold flanges including a portion recessed inwardly from the interior wall and first and second mating sections, the recessed portion including means for introducing air into the passageway between the reducing catalyst and the oxidizing catalyst,

the first mating section including a stud, and the second mating section including an aperture, the aperture of said second mating section being sized and positioned to receive the stud of the first mating section,

and wherein each shell half includes a portion of the interior wall for attaching the pair of flanges of the manifold halves, the portion having a greater longitudinal extent than the longitudinal extent of the pair of manifold flanges.

4,501,119

PUMP JACK

George E. Stanton, Orient, Ohio, assignor to NuJack Oil Pump Company, Columbus, Ohio

Filed Feb. 28, 1983, Ser. No. 470,587

The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.

Int. Cl.³ F15B *13/04*

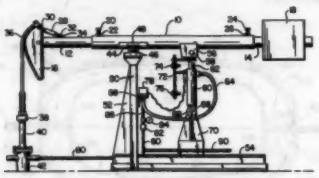
U.S. Cl. 60—398 **13 Claims**

1. A pump jack including in combination a mounting base having mounted thereon a support member, a rocker arm pivotally mounted on said support member, said rocker arm

being divided by said pivotal mounting into a sucker rod limb and a drive limb, the sucker rod limb having a sucker rod attached to its end most remote from the pivotal mounting, and the drive limb having one end of a piston of a pneumatic motor pivotally attached thereto intermediate the pivotal mounting and the end of the drive limb remote from said mounting,

said piston extending from a cylinder mounted on said mounting base,

said sucker rod projecting into a well casing, gas under pressure exiting from said casing, means for delivering



said exiting gas to said cylinder to drive said piston in one direction,

switch means for opening and closing the cylinder to the gas to thereby reciprocate the piston within the cylinder and pivot the rocker arm about said pivotal mounting,

means for adjusting the length of the stroke of said piston,

two means for adjusting the length of the sucker rod limb without changing the length of the drive limb,

means for adjusting the length of the drive limb without changing the length of the sucker rod limb.

4,501,120

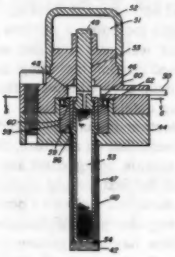
REFRIGERATION SYSTEM WITH CLEARANCE SEALS

Noel J. Holland, Burlington, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 241,418, Mar. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,141, Mar. 28, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,350

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **16 Claims**



1. In a refrigerator having a displacer which reciprocates in a housing, there being a working volume of gas and a spring volume of gas in contact with end surfaces of the displacer and separated by a fluid seal surrounding the displacer, the displacer being driven entirely by pressure differentials between the working volume and the spring volume with the phase relationship between the pressure differential and the displacer movement being dependent on a retarding force on the displacer, the improvement of:

a clearance seal of cooperating clearance seal elements comprising ceramic material between the working volume and the spring volume to provide virtually dragless fluid sealing;

a clearance seal of cooperating clearance seal elements comprising ceramic material around the displacer, between portions of the working volume at opposite ends of the displacer, to provide virtually dragless fluid sealing; and

means other than fluid seals for loading the displacer and thus retarding movement of the displacer.

4,501,121

METHOD OF HEAT EXCHANGE AND REFRIGERATING DEVICES

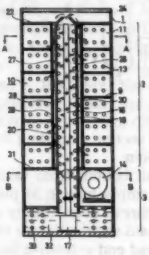
Masahiko Izumi, 13-14, 2-chome, Nishimagome, Oota-ku, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,809

Claims priority, application Japan, Apr. 23, 1982, 57-67259

Int. Cl.³ F24F *3/16*

U.S. Cl. 62—78 **6 Claims**



1. A method of providing a flow of air saturated with water comprising the steps of flowing air upwardly through a heat exchanger, positioning said heat exchanger generally vertically, providing an evaporator coil or a refrigerating machine inside said heat exchanger, providing a supply of water at the lower end of said heat exchanger, spraying water from said supply of water inside said heat exchanger onto said evaporator coil, flowing air to be saturated with said water through the inside of said heat exchanger in contact with said coil and with said sprayed water therein, and providing an amount of water in said step of spraying water larger than the amount of water said flow of air is capable of carrying, whereby the excess water in the form of the larger droplets thereof automatically returns to said supply of water by falling downwardly through said heat exchanger.

4,501,122

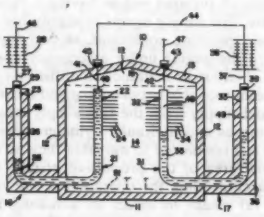
LIQUID PISTON HEAT PUMP

Donald R. Cutler, Bolingbrook, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 25, 1983, Ser. No. 526,461

Int. Cl.³ F25B *1/00*

U.S. Cl. 62—116 **15 Claims**



1. A heat pump system comprising:

(a) a plurality of adjacent substantially similar piston bodies,

each body having an evaporator end section and a condenser end section;

(b) a working fluid in each of said piston bodies and said fluid being the same in all of said piston bodies, said fluid forming a liquid piston and a vapor above said piston;

(c) a condenser associated with each piston bodies, each of paid condensers having a drain end connected to said condenser end section of the associated piston body, and

(d) a plurality of vapor pipes, one of said pipes connecting said feed end of each condenser to said evaporator end of an adjacent piston body, there being a free flow of said vapor through said vapor pipes from said evaporator end section of each body to said feed end of the associated condenser and said vapor pipes being substantially devoid of regenerators; and,

(e) said evaporator end section of each body being adapted to be located in a relatively warm first area and said condensers being adapted to be located in a relatively cooler second area, and said pistons being adapted to oscillate because of the temperature difference between said first and second areas.

4,501,123

COOLING APPARATUS FOR MACHINERY

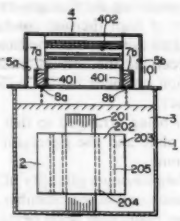
Teruo Ina, Takarazuka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,913

Claims priority, application Japan, Dec. 3, 1982, 57-213012

Int. Cl.³ F25D *15/00*

U.S. Cl. 62—119 **5 Claims**



1. A cooling apparatus for machinery comprising:

a tank having a body of vaporizable refrigerant sealed therein and in which the machinery to be cooled is immersed;

a condensing means above said tank and having a plurality of cooling tubes therein;

distributing pipes connecting said tank to said condensing means, and distributing pipes each extending from the tip of said tank to said cooling tubes for conveying vapor phase vaporizable refrigerant generated within said tank as the result of heating by the heat generated in said machinery to said cooling tubes; and

a condensed refrigerant accumulating means positioned in said distributing pipes and filling only a portion of the cross-section of the respective distributing pipe for receiving liquid refrigerant condensed in said cooling tubes and having restricted passage means extending into said tank for returning liquid refrigerant to said tank, said restricted passage being sufficiently small that when liquid refrigerant is accumulated in said accumulating means the vapor phase of said vaporizable refrigerant from said tank cannot penetrate through it.

4,501,124

APPARATUS FOR LEAKAGE DETECTION OF CRYOGENIC MATERIALS

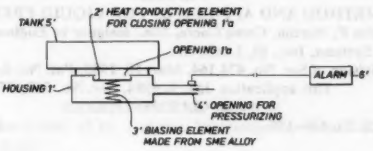
Edward B. Shone; Robert W. Wilson, and Gordon L. Cunningham, all of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 458,685, Jan. 17, 1983, abandoned. This application Jan. 17, 1984, Ser. No. 571,146

Claims priority, application United Kingdom, Sep. 18, 1980, 8030160

Int. Cl.³ G01K *13/00*

U.S. Cl. 62—129 **1 Claim**



1. A device for detecting a leak of cryogenic material from a structure containing the material and triggering an alarm, the device comprising a heat-conductive element located to receive cryogenic material falling from the cryogenic material-containing structure, a biasing element made from a shape memory effect alloy which contacts the heat-conductive element and is operative to effect a displacement of the heat-conductive element according to the cryogenic temperature to which the biasing element is subjected, a housing provided with an opening which is closed in the absence of a leak of the cryogenic material onto the heat-conductive element, another opening in said housing for receiving pressurized fluid medium, and means for conveying a pressure drop signal from said housing to trigger an alarm.

4,501,125

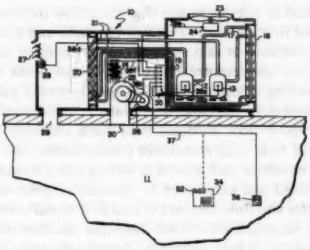
TEMPERATURE CONDITIONING SYSTEM STAGING CONTROL AND METHOD

Doyoung Han, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Dec. 5, 1983, Ser. No. 557,983

Int. Cl.³ F25B *7/00*

U.S. Cl. 62—175 **15 Claims**



1. A control for a temperature conditioning system having a plurality of stages that may be selectively energized to meet a temperature conditioning demand in a zone, said control comprising

a. a temperature sensor disposed within the zone;

b. means for selecting a zone setpoint temperature; and

c. means responsive to the temperature sensor and the setpoint selecting means, for controlling the temperature conditioning stages as a function both of the deviation of the zone temperature from the setpoint temperature, and

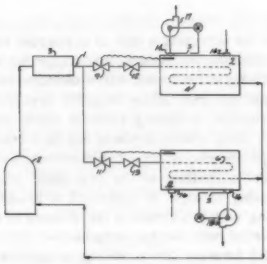
of the rate of change of the temperature in the zone, said control means including means for selectively energizing or de-energizing the stages of temperature conditioning depending upon the range in which the deviation of the zone temperature from the setpoint temperature lies, and predefined limits for the rate of change in the zone temperature that are associated with that range.

4,501,126

METHOD AND APPARATUS FOR LIQUID FREEZING

John P. Norton, Creve Coere, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Division of Ser. No. 474,164, Mar. 10, 1983, Pat. No. 4,459,812.
This application Jan. 9, 1984, Ser. No. 569,177
Int. Cl.[3] F25D *17/02*
U.S. Cl. 62—185 3 Claims



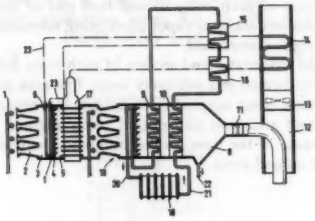
1. Apparatus for rapidly freezing a cool pack chamber comprising: a refrigeration system including a compressor, a condenser, first and second evaporators in said system, first and second liquid chiller chambers respectively enclosing said first and second evaporators, each chiller chamber having fluid inlet and outlet conduit sets provided with quick disconnect fittings and a pump to circulate a liquid cooling medium therethrough, said refrigeration system further including temperature regulating means for said evaporators whereby a first liquid cooling medium in said first chiller chamber can be maintained at a temperature slightly above the freeze point to bring said first medium to a slush-like state and a second liquid cooling medium in said second chiller chamber can be maintained at a temperature below the freeze point of said first liquid cooling medium and an independent cool pack comprising a separately portable heat transfer envelope defining an uninterrupted flow through cool pack chamber including a first set of fluid inlet and outlet conduits disposed in said heat transfer envelope and provided with quick disconnect coupler fittings sized and positioned to connect respectively with the fluid outlet and fluid inlet set of said first liquid chiller chamber to allow introduction of said slush-like medium into said cool pack chamber, a heat exchange element disposed in said cool-pack chamber extending in uninterrupted fashion substantially throughout said chamber, said heat exchange element including a second fluid inlet and outlet conduit set disposed in said heat transfer envelope and provided with quick disconnect coupler fittings sized and positioned to connect respectively with the fluid outlet and fluid inlet set of said second liquid chiller chamber to allow introduction of said liquid cooling medium from said second chiller chamber which is below the freeze point of said slush-like medium introduced into said cool pack chamber from said first liquid chiller to cause said slush-like medium to freeze.

4,501,127

HEATING SYSTEM INCORPORATING AN ABSORPTION-TYPE HEAT PUMP AND METHODS FOR THE OPERATION THEREOF

Hans Sommers, Essen, and Theo Jannemann, Dorsten, both of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,355
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040628; Apr. 3, 1981, 3113417
Int. Cl.[3] F25B *27/02, 15/00*
U.S. Cl. 62—238.3 43 Claims



1. In a heating system with a fuel gas-fired absorption-type heat pump having a refrigerant solution loop of generator, condenser, evaporator and absorber, in which the generator is located in the flue duct of the gas burner and in which the refrigerant solution loop is coupled to the heating water loop by means of heat exchangers:

the gas burner is an aerated gas burner combusting a fuel-lean mixture;

said burner having at least one fuel delivery orifice, at least one parallel mixer tube receiving the fuel gas from the orifice and entraining combustion air;

mixer means receiving the fuel gas and entrained air;

a burner plate of high thermal conductance on which the fuel gas and air mixture is burned and a sealed combustion chamber receiving the burning mixture;

said combustion chamber being connected downstream to said flue duct;

said generator being arranged so that the distance between the burner plate and the generator is less than approximately 50 mm.;

said burner plate having a plurality of mixture passing ports leading to said combustion chamber distributed across the entire burner plate, said ports being not less than 4 ports for each square centimeter; and

a closed refrigerant piping system including piping means for passing rich refrigerant solution from said absorber to said generator, said piping means including means for cooling said burner plate by transfering heat from said burner plate to said rich solution before said generator, said cooling means being bonded to the surface of said burner plate opposite from said generator.

4,501,128

HEAT RECLAMATION

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201

Filed May 5, 1982, Ser. No. 374,936
Int. Cl.[3] F28D *7/08*
U.S. Cl. 62—238.6 9 Claims

1. Heat reclamation apparatus incorporating,

(a) a water system including a cold water inlet and hot water outlet, and

(b) a movable refrigerator separate from and operable independently of the water system, and generating heat as a necessary function of its operation,

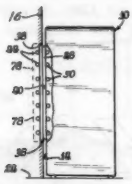
wherein,

the water system includes a receptor heat exchanger unit

through which the water flows, and which has a first exposed surface,

the refrigerator includes a donor heat exchanger unit having a second exposed surface receiving the heat generated by the refrigerator, and

the refrigerator is movable into and out of a position in which its said second exposed surface is in heat transfer engagement with said first exposed surface, and those exposed surfaces are also detached and separate items without interconnection except loose contact engagement.



the receptor heat exchanger unit is mounted in the wall structure with said first exposed surface thereof lying substantially flush in said wall surface, and

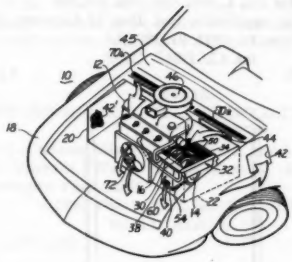
the donor heat exchanger unit is so positioned in the appliance that the second exposed surface of that unit is adjacent an exterior surface of the appliance, and the appliance is so positionable in said space, adjacent the wall, that the donor heat exchanger unit engages the receptor heat exchanger unit.

4,501,129

INTEGRAL ENGINE AIR CONDITIONING SYSTEM

Herbert N. Charles, Chatham, Canada, assignor to Canadian Fram Limited, Chatham, Canada

Filed Jan. 24, 1983, Ser. No. 460,229
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—239 **2 Claims**



1. An air conditioning system for cooling an internal compartment of a vehicle having an engine forwardly mounted relative to the internal compartment including an engine driven compressor, an evaporator communicated with the internal compartment, at least one condenser connected in circuit with the compressor and evaporator, comprising:

compartment means for providing an enclosed volume formed by a hood, inner fender liners, vehicle firewall and belly pan linking same;

air inlet means situated on the vehicle and positioned on a portion of the vehicle forward of the internal compartment that does not receive ram air, and for communicating the non-ram air to the compartment means, and wherein at least one condenser is situated relative to said air inlet means to receive the non-ram air prior to communication to said compartment means;

blower means driven by the vehicle's engine and having an inlet positioned within said compartment means and an outlet adapted to discharge air out from said compartment means;

damper means responsive to at least one air conditioning parameter, mounted in series with said blower, for controlling the air flow therethrough and

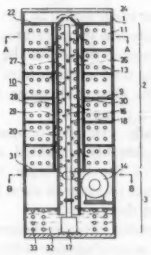
an auxiliary fan positioned at the perimeter of said compartment means, responsive to control signals input thereto for withdrawing air from said compartment means and for increasing the air flow across said condensers.

4,501,130

REFRIGERATING DEVICE

Masahiko Izumi, 13-14, 2-chome, Nishimagome, Oota-ku, Tokyo, Japan

Continuation of Ser. No. 479,809, Mar. 28, 1983,. This application Apr. 24, 1984, Ser. No. 603,650
Claims priority, application Japan, Apr. 23, 1982, 57-067259
Int. Cl.³ A47F *3/04*
U.S. Cl. 62—247 **8 Claims**

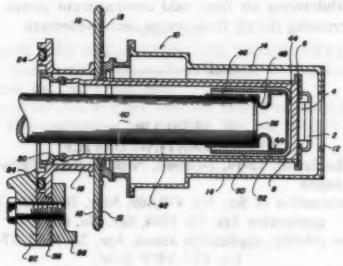


1. A refrigerated showcase wherein a flow of water saturated air is brought into direct contact with the goods displayed in the showcase, said showcase being oriented generally vertically, said showcase being divided into a main showcase space, a generally horizontal machinery and water storage space below said main space, and a generally vertical return space at the back of said main space, access door means at the front of said main space, a vertically disposed heat exchange means positioned at the back of said main space and interconnecting said main and water storage spaces, an evaporator coil means forming part of a refrigerating machine, means to position said evaporator coil means on the inside of said heat exchanger, pump means for pumping water from said water supply into said heat exchanger, nozzle means, said pump means pumping said water from said water supply through said nozzle means and into the inside of said heat exchanger, fan means, said fan means comprising means to pump air from said return space into said heat exchanger, whereby said air from said fan means flows through said heat exchanger in contact with said evaporator means and said sprayed water therein to thereby become saturated with water, means to flow said air through said heat exchanger from the lower end to the upper end thereof, whereby any excess water in the form of the larger droplets thereof automatically returns to said water supply by falling downwardly through said heat exchanger into said water supply, means to flow the water saturated air exiting from said heat exchanger into said main space, and means to return the air flow from said main space to a suction side of said fan via said return space.

4,501,131
CRYOGENIC COOLER FOR PHOTOCONDUCTIVE CELLS

Virginia R. Gaskin, Orlando; Eugene P. Horvath, Longwood, and Richard M. Jansson, Maitland, all of Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1984, Ser. No. 567,727
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **4 Claims**



1. In the apparatus for maintaining an electromagnetic radiation detector at extremely low temperatures wherein the detector is placed in a cryogenic cooler in the form of a Dewar vacuum chamber mating with a refrigerator cold finger including a tip which cools the Dewar chamber, a thermal coupling heat transfer mechanism comprising;

(1) a circumferentially crimped temperature conducting tubular member slideably mounted on, and thermally engaging the end of, the cold finger, with its annular or radial crimp adapted to retain a shim between the tip of the cold finger and the crimp,

(a) the tubular member being sufficiently thin-gauged so that its thinness in combination with the crimp permits the tubular member to flex, avoiding damage to the Dewar chamber should physical contact occur during assembly,

(b) the diameter of the tubular member upper portion above the radial crimp being enlarged so that the tube sides are in close proximity to the Dewar chamber walls; and

(2) a heat transfer cap integral with the enlarged tubular member upper portion adapted to be radiantly cooled thereby, and to be spaced from the Dewar wall a distance slightly exceeding the differential of expansion of the thermal coupling,

(a) the sides of said cap extending downwardly over the tubular member and cold finger top and along the Dewar chamber wall providing an increased Dewar wall cooling surface.

4,501,132
PRESSER FOOT MECHANISM IN A KNITTING MACHINE

John Flavell, Coundon; Keith Jeffcoat, Nuneaton, and Max W. Betts, Coventry, all of United Kingdom, assignors to Courtaulds PLC, London, England

Continuation-in-part of Ser. No. 848,296, Nov. 3, 1977, abandoned. This application Jul. 15, 1981, Ser. No. 283,509
Int. Cl.³ D04B *7/04*
U.S. Cl. 66—64 **1 Claim**

1. In a flat knitting machine having two opposed needle beds each having a needle array containing needles operated by a cam system located in a cam box arranged to move, in use, along said needle arrays, and also having a support mounted for movement in synchronism with the cam box along the needle arrays, a presser foot assembly for pressing down on fabric as it is knitted, comprising:

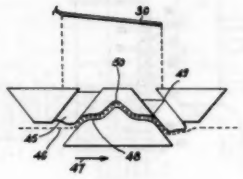
(a) a supporting arm mounted on said support and projecting generally downward therefrom;

(b) a slider;

(c) structure on said supporting arm mounting said slider for sliding movement along said arm substantially midway between said needle beds;

(d) a unitary presser foot carried entirely on said slider;

(e) said presser foot being thereby mounted for sliding movement on said supporting arm in a generally up-and-down direction;



(f) resilient means arranged to urge said slider downwardly on said supporting arm;

(g) said presser foot being located in a position in relation to said cam system such that the presser foot extends from a region in advance of the rising needles to the rear of the fully raised needles in said machine; and

(h) said presser foot thus providing a resiliently mounted slidably raisable element controlling stitches on the needles of the machine over descending as well as rising movement of said needles.

4,501,133
DUAL NEEDLE ARRANGEMENT

Gisela Kretzschmar, Wesseling, and Jutta Selter, Altena, both of Fed. Rep. of Germany, assignors to Gustav Selter, Altena, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,108
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126451; Nov. 11, 1981, 8132901[U]
Int. Cl.³ D04B *35/02*
U.S. Cl. 66—117 **7 Claims**

1. A knitting and crocheting needle arrangement comprising:

a knitting needle having a tip and a rear end;

a hook-type crocheting needle also having a tip and a rear end;

a flexible cord connected between said rear ends of said needles; and

an eye in said cord generally midway between said rear ends and dimensioned and positioned such that a filament threaded through said eye can be laid into goods crocheted or knitted by said arrangement.

4,501,134

ROLLING MILL PLANTS

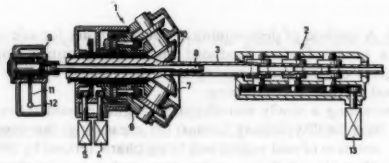
Karl-Hans Staat, Homberg/Ratingen, and Hermann Möltner, Grevenbroich, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,216

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220921

Int. Cl.³ B21B *23/00*

U.S. Cl. 72—8 **4 Claims**



1. A rolling mill plant for rolling tubular product comprising a planetary skew rolling mill and a reducing or sizing rolling line which is disposed a short distance therebeyond on a common pass line, drive means for driving said planetary skew rolling mill, drive means for said reducing or sizing roll line, a mandrel rod in said planetary skew rolling mill for rolling tubular blooms therein, mounting means adjacent said planetary skew rolling mill for holding said mandrel, a torque measuring device at the mandrel mounting means for regulating the planetary skew rolling mill drive means operatively connected between the mandrel rod and its mounting means, a tension and compression measuring device operatively connected to the reducing or sizing rolling line which is effective in either direction relative to the rolling direction to measure the axial load in the work material and which regulates the drive of the reducing or sizing rolling line, whereby stressing of the work material in the region between the planetary skew rolling mill and the reducing or sizing rolling line is avoided.

4,501,135

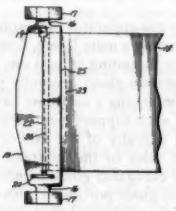
STRESS SENSOR FOR YIELD-POINT DETECTION IN A STRETCH PRESS

David E. Chivens, Mission Viejo, Calif., and Laramie J. Cloward, Chehalis, Wash., assignors to L & F Industries, Huntington Park, Calif.

Filed Feb. 9, 1982, Ser. No. 347,305

Int. Cl.³ B21C *51/00*

U.S. Cl. 72—302 **7 Claims**



1. In combination with a stretch press having a base, and an elongated gripping-jaw assembly having a frame supported on the base, the assembly being adapted to grip a metal part to be stretch formed by the press, an improved sensor for monitoring tensile stress in the part during stretch forming, the sensor comprising:

a light source for projecting a light beam along the jaw assembly, the source being rigidly secured to the jaw assembly so the beam is deflected as the jaw assembly is elastically deformed by reaction force of the part during stretch forming; and

means secured to the jaw assembly for monitoring deflection of the beam, and for generating a signal related to beam position and hence to tensile stress in the part, the signal being comparable to a second signal related to part strain whereby a stress-strain relationship in the part can be monitored during stretch forming.

4,501,136

DEVICE FOR STRAIGHTENING AUTOMOBILE BODIES OR THE LIKE

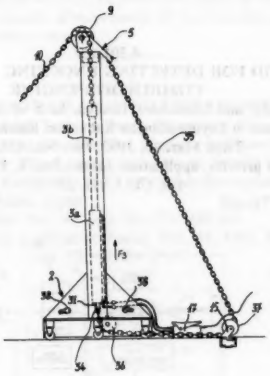
Germain Celette, Vienne, France, assignor to Celette S.A., Vienne, France

Filed Apr. 27, 1982, Ser. No. 372,314

Claims priority, application France, Mar. 30, 1982, 82 05395

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—447 **9 Claims**



1. A device for straightening vehicle bodies comprising

a vertical column having a guide pulley supported at an upper end thereof and being carried upon a movable base,

a traction jack vertically disposed within said vertical column and having a body portion and an operating rod extending from said body portion,

a traction chain for connection to the vehicle to be straightened when applying a straightening force to the vehicle body,

said traction chain having one end coupled within the interior of said vertical column to the operating rod of said traction jack and another end passing out from the interior of said vertical column over said guide pulley supported at the upper end thereof for connection to the vehicle body upon which a straightening force is to be applied,

a collar carried on said vertical column and selectively positionable in a vertical direction relative thereto, said collar including a guide pulley positioned to engage said traction chain for applying a straightening force to the vehicle body in a predetermined direction at a vertical height determined by the selective positioning of said collar,

a first retaining means engageable with said collar for attaching said device to the ground to secure said device in a fixed position while applying a straightening force to a vehicle body,

said movable base including a guide pulley supported thereby with a second retaining means passing thereabout, said second retaining means being secured at one end to said collar and at an opposite end to said body portion of said traction jack,

said device being movable about the vehicle body to be straightened, free from any connection therewith other than said traction chain for applying a straightening force thereto,

said movable base upon which said vertical column is carried having a horizontal bottom wall which is disposed a short distance above the ground, and

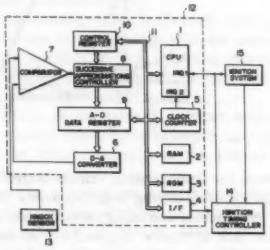
runner wheels carried by said movable base and having resilient pads positioned between said movable base and said runner wheels so that upon application of a straightening force to the vehicle through said traction chain, said horizontal bottom wall will compress said resilient pads and contact the ground to enhance the stability of the device during use.

4,501,137

METHOD FOR DETECTING KNOCKING IN INTERNAL COMBUSTION ENGINE

Keiji Aoki, and Shinichiro Tanaka, both of Shizuoka, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1983, Ser. No. 475,650
Claims priority, application Japan, Jun. 7, 1982, 57-97351
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **11 Claims**



1. A method for detecting knocking in an internal combustion engine using a knock sensor, the method comprising the steps of:

calculating a mean value of an output signal of the knock sensor;

sensing a value corresponding to the rotational speed of the engine;

determining a constant such that said constant is a large value when the engine rotational speed is within a low speed range and a high speed range, and is a small value when the engine rotational speed is within a intermediate speed range;

calculating a reference value by multiplying said mean value by said constant;

comparing an instantaneous output signal of the knock sensor with said reference value; and

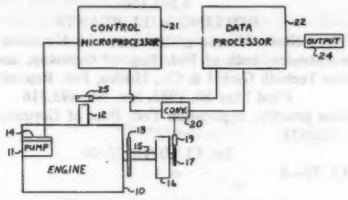
producing a knocking signal indicative of the occurrence of knocking when said instantaneous output signal exceeds the reference value.

4,501,138

DYNAMIC ENGINE POWER ASSESSMENT

James C. McCandless, Sheboygan, Wis., assignor to International Harvester Co., Chicago, Ill.

Filed Mar. 10, 1983, Ser. No. 474,212
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **11 Claims**



9. A method of determining the acceptability for sale of one of a series of mass produced internal combustion engines, engines of said series having a predetermined average rotational inertial, I, comprising:

mounting a newly manufactured engine of said series on a test facility having means for measuring the speed of rotation of said engine and being characterized by the lack of a calibrated power absorbing and measuring device;

starting said engine and performing a gross evaluation of its operation;

operating said engine at a low speed;

accelerating said engine at wide open throttle to a high speed without dissipating power therefrom;

measuring the speed of rotation of said engine during said accelerating step;

determining during said accelerating step the mean angular acceleration of engine within at least two small discrete speed intervals corresponding respectively to at least two test speeds above said low speed and below said high speed;

computing engine torque at said test speeds according to the equation $T=I\alpha$ wherein I is said predetermined average rotational inertia of said engine series and portions of said test facility driven thereby and α is determined means acceleration in said discrete intervals;

comparing said computed torques to predetermined ranges of acceptable torques for said engine series;

and rejecting said engine if said computed torques are outside said predetermined ranges.

4,501,139

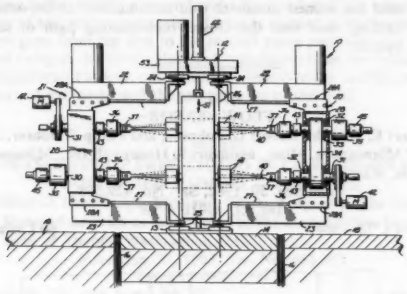
TEST SYSTEM FOR TESTING FRONT WHEEL DRIVE COMPONENTS OF AUTOMOBILES

Paul S. Petersen, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Aug. 26, 1983, Ser. No. 526,920
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **19 Claims**

1. A four square test apparatus for testing rotating specimens under torsion including a main frame, first means supported on said main frame for mounting at least one pair of test members to be tested for rotation about generally parallel, spaced axes, said first means comprising a subframe having at least a pair of support members, each support member extending laterally of the subframe and laterally of the axis of rotation of the test members on both sides of the subframe to form end guide portions, a pair of elongated guide members mounted on said main frame, the end guide portion of both support members on one lateral side of the subframe being slidably mounted on one of the guide members and the end guide portion of both support members on the other lateral side of the subframe being slidably mounted on the other of the guide members, means for loading said test members in torsion relative to each other

while supported on said main frame, means for rotating said test members simultaneously, and means for moving said first



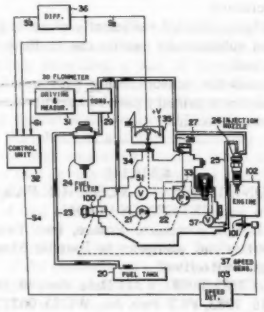
means reciprocally as guided by the guide members during rotation of both of said test members.

4,501,140

FUEL INJECTION RATE DEDUCING SYSTEM FOR A DIESEL ENGINE

Toyoaki Nakagawa, Yokosuka; Masao Nakajima, Atsugi; Yoshihisa Kawamura, and Nobukazu Kanesaki, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 29, 1982, Ser. No. 428,221
Claims priority, application Japan, Nov. 20, 1981, 56-186497
Int. Cl.³ F02M *59/00*
U.S. Cl. 73—119 A **12 Claims**



1. A fuel injection rate deducing system for a diesel engine, comprising:

(a) a fuel injection pump having an inlet, an outlet, and an overflow outlet, the outlet being connected to the engine for conducting fuel from the injection pump to the engine to effect fuel injection, the overflow outlet being internally connected to the inlet;

(b) a fuel feed line connected to the inlet of the injection pump for conducting fuel to the injection pump;

(c) a fuel feed pump disposed in the feed line for driving fuel into the injection pump via the feed line;

(d) a fuel return line connecting the overflow outlet of the injection pump to the feed line at a position upstream of the feed pump, whereby at least some of the fuel conducted to the injection pump via the inlet thereof exits from the injection pump via the overflow outlet thereof and then re-enters the feed pump via the return line and the feed line; and

(e) means for measuring the rate of fuel flow through the feed line upstream of the connection of the return line to the feed line,

wherein the injection pump is driven by the engine and has movable means for determining the rate of fuel injection in accordance with position of the movable means and wherein the measuring means generates a signal indicative of the rate of fuel flow through the feed line, and further comprising

means for sensing the position of the movable means and generating a signal indicative thereof,

means responsive to the movable means position signal for determining the velocity of movement of the movable means and generating a signal indicative thereof,

means responsive to the movable means velocity signal for judging whether or not the velocity of movement of the movable means is within a preset range and generating a signal indicative thereof,

means for sensing the rotational speed of the engine and generating a signal indicative thereof, and

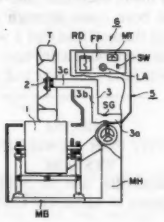
means responsive to the signal generated by the judging means, the movable means position signal, the fuel flow rate signal, and the engine speed signal for deducing the rate of fuel injection on the basis of the rate of fuel flow through the feed line when the velocity of movement of the movable means is within the preset range and deducing the rate of fuel injection on the basis of the position of the movable means and the rotational speed of the engine when the velocity of movement of the movable means is out of the preset range.

4,501,141

APPARATUS FOR MEASURING TIRE UNIFORMITY

Shigewo Takayanagi, Nagoya; Junzo Hasegawa, Obu; Hayashi Yasutaka, Nagoya; Shunichi Doi, Nagoya, and Satoru Matsushima, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Nov. 9, 1982, Ser. No. 440,464
Claims priority, application Japan, Nov. 19, 1981, 56-186433
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **20 Claims**



1. A tire uniformity measuring apparatus comprising:

a drum for rotatively driving a tire to be measured;

a rotatable shaft having an attachment for securing the tire in position;

a movable member rotatably supporting said rotatable shaft and being movable with respect to said drum about a fulcrum which lies substantially in a contact plane which includes the surface in which said drum and the tire meet as they are held against each other while in rolling movement, the axis of said fulcrum being positioned in a direction perpendicular to the axes of said drum and said tire, a said movable member including a portion capable of movement in dependence on a load acting between said drum and the tire being measured;

a load applying means for applying a predetermined load to the tire by changing the interaxial distance between said drum and said rotatable shaft by moving said drum;

a displacement detecting means for detecting a displacement

of said rotatable shaft as a function of said movement of said movable member in dependence on a variation in a load applied radially to the tire while the latter is rotated by said drum; and

display means for displaying the variation in the load applied radially of the tire in response to the displacement of said movable member;

whereby the variation in the load imposed on the tire can be measured.

4,501,142

TIRE PRESSURE GAUGE

Tien T. Huang, No. 4, 30 La., Wu-Chuang St., Pan-Chiao City, Taipei, Taiwan

Filed Mar. 29, 1983, Ser. No. 480,123

Int. Cl.³ B60C *23/02*; G01L *7/08*

U.S. Cl. 73—146.8 **2 Claims**

1. A tire pressure gauge of the type having a tube member with first and second ends in which a diaphragm member is provided crosswise and is suspended by a spring to sense the pressure of a tire to which said first end is attached, and in which an indicator rod is movably provided lengthwise to be actuated by said diaphragm to extend outwardly through said second end of said tube member for visible indication, wherein the improvement is made such that said indicator rod is provided with an axial bore open through one of its ends and closed at another end thereof, and that a writing means having an ink holder is received in said axial bore and is mounted in a fixed relationship with said indicator rod.

4,501,143

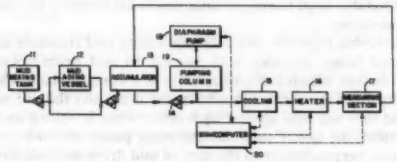
PREPARATION UNIT FOR A DRILLING MUD TESTING SYSTEM

Maurice Prior, Duncanville, and M. Scott Quigley, Garland, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,569

Int. Cl.³ G01N *33/24*

U.S. Cl. 73—153 **6 Claims**



1. A system for testing drilling mud comprising:

measuring means for testing the parameters of said drilling mud;

an accumulator for pressurizing said drilling mud;

means for pumping pressurized drilling mud through a closed recirculating path through said measuring means;

means for mixing and aging drilling mud to prepare drilling mud for testing; and

means for selectively supplying prepared drilling mud from said last named means to said accumulator to introduce drilling mud into the closed recirculating path of said system.

4,501,144

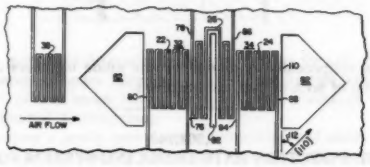
FLOW SENSOR

Robert E. Higashi; Robert G. Johnson, and Philip J. Bohrer, all of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 429,598

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **60 Claims**



1. A flow sensor, comprising:

a thin film heater suspended in air by thin film dielectric;

a pair of thin film heat sensors suspended in air by thin film dielectric and disposed on opposite sides of the heater;

means for operating the heater at a temperature elevated above ambient, thus creating a no-flow temperature gradient in the air above and adjacent to the heater, the temperature within the no-flow gradient making a transition between the elevated temperature and substantially ambient temperature;

the sensors being located sufficiently close to the heater to be located substantially within the no-flow temperature gradient; and

the heater and the sensors being substantially thermally isolated so that a primary path of heat between the heater and the sensors is air.

4,501,145

IMMERSION THERMAL EXCHANGE PARAMETER DETERMINATION

Jean-Charles Boegli, Lucinges, France, and Yves Trouilhet, Vesenaz, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

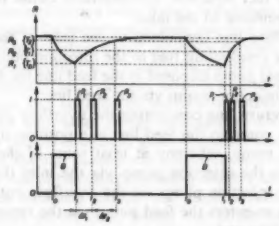
PCT No. PCT/CH82/00087, § 371 Date Mar. 10, 1983, § 102(e) Date Mar. 10, 1983, PCT Pub. No. WO83/00227, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 9, 1982, Ser. No. 486,960

Claims priority, application Switzerland, Jul. 13, 1981, 4563/81

Int. Cl.³ G01F *1/68*; G01N *27/18*

U.S. Cl. 73—204 **3 Claims**



1. A process for the determination of at least one instanta-

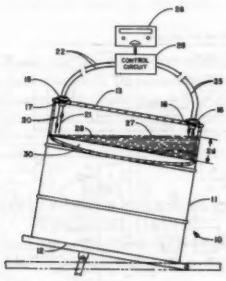
neous parameter of a fluid linked to the thermal exchange of a probe immersed in said fluid, comprising the steps of raising the temperature of said probe immersed in said fluid to a first given value, setting a second and a third value of the temperature of said probe, measuring the times elapsed as the temperature goes from the first to the second value and from the second value to the third value, and calculating from the resulting measurement at least one parameter linked to the coefficient of thermal exchange and the temperature of the fluid.

4,501,146

DETECTION OF FREE LIQUID IN CONTAINERS OF SOLIDIFIED RADIOACTIVE WASTE

Wilbur O. Greenhalgh, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1983, Ser. No. 461,283
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 B **4 Claims**



1. A method for nondestructively detecting liquids on the top surface of solidified material contained in a sealed enclosure comprising: providing a pair of devices utilizing wave energy for measuring the level of contents contained in the enclosure, mounting said devices in the top wall of the sealed enclosure at diametrically opposed locations, respectively, adjacent the periphery of said top wall, tilting said enclosure toward one of said measuring devices while simultaneously measuring by said device the level of said contents at the two diametrically spaced locations, noting and determining the level value of said contents measured by one of said one devices when the level value measured by the other of said devices remains constant, whereby any measured difference of level values of the contents between the two spaced locations indicates the presence of liquid within the sealed enclosure.

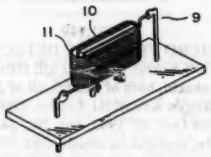
4,501,147

CONTROL CIRCUIT FOR A HUMIDITY SENSOR

Takashi Niwa, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP82/00010, § 371 Date Sep. 10, 1982, § 102(e) Date Sep. 10, 1982, PCT Pub. No. WO82/02598, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 13, 1982, Ser. No. 420,220
Claims priority, application Japan, Jan. 16, 1981, 56-5259
Int. Cl.³ G01W *1/00*; H05B *6/68*
U.S. Cl. 73—336.5 **5 Claims**

1. In a circuit arrangement comprising a humidity sensor with a humidity responsive region and a heater for heating said humidity responsive region, a power supply circuit for supplying power to said heater, a means for switching on and off the power supplied from said power supply circuit to said heater, a resistor connected in series with said humidity responsive region of said humidity sensor, a means for supplying a voltage across said humidity responsive region and said resistor, and an amplifier circuit for amplifying a voltage which appears across said resistor, a control circuit for said humidity sensor having a means to change the resistance value of said resistor such that a curve of said amplifier circuit's output voltage vs. the resistance of said humidity sensor's humidity responsive region



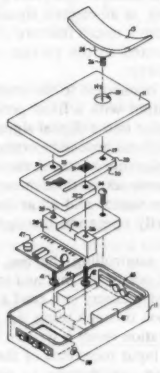
characteristic present during humidity detection is different from that present during detection of the temperature of said humidity responsive region being heated by said heater.

4,501,148

MANUAL MUSCLE TESTER

James A. Nicholas, 22 Cayuga Rd., Scarsdale, N.Y. 10583, and Richard Krukowski, 205 Washington Ave., Chatham, N.J. 07928

Filed Jan. 5, 1982, Ser. No. 337,304
Int. Cl.³ G01L *5/02, 1/18*
U.S. Cl. 73—379 **21 Claims**



20. A small, portable and self-contained manual muscle testing instrument including:

(a) a housing having first and second broad faces spaced apart by narrower wall portions,

(b) force responsive actuator means communicating between the interior and the exterior of the housing and having means located on the same side of the housing as the first broad face for engagement by a test subject whose muscular strength is to be assessed,

(c) the second broad face comprising a relatively flat area for engagement by at least one hand of a test administrator in force transmitting relation to the instrument in opposition to force applied to the actuator means by the test subject,

(d) transducer means within the housing connected with the actuator means for producing an electrical signal representative of the force applied between the subject and the administrator, and

(e) digital display means for representing said force,

said relatively flat area for engagement by at least one hand of a test administrator and the force responsive actuator means being opposite one another whereby a test administrator can manually exert force on the instrument via the second broad face, in a direction perpendicular to that

face and in opposition to the force exerted by the test subject consistent with known subjective muscle tests to produce on the digital display means an accurate representation of the force developed between the administrator and the subject.

4,501,149

MICRO FRACTURE DETECTOR

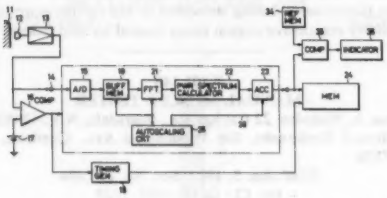
Junichi Konno, Oi; Yukihiro Ueda, Fuji; Hiroaki Niitsuma, and Noriyoshi Chubachi, both of Sendai, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1983, Ser. No. 543,707

Claims priority, application Japan, Oct. 29, 1982, 57-191335

Int. Cl.³ G01N *29/04*; G06F *15/332*

U.S. Cl. 73—587 **11 Claims**



1. A micro fracture detector comprising:

a pickup for sensing, as an electric signal, an acoustic emission resulting from a micro fracture of an object;

an amplifier connected to the pickup, for amplifying the output of the pickup;

an A/D converter connected to the amplifier, for sampling the amplified output with a fixed period and converting each sampled value into a digital signal;

a fast Fourier transform processor comprised of a cascade connection of a plurality of stages, each including first and second input memories, a third memory having stored therein a rotation vector and an arithmetic unit for performing a Butterfly operation through using a pipelined architecture;

control means for controlling the fast Fourier transform processor so that one of the first and second input memories and the third memory are read out to perform the Butterfly operation through using the pipelined architecture and the operation result is written into that one of the first and second input memories of the next stage which has not been read out, thereby to perform a pipelined operation by all the stages as a whole, and for writing the digital signal from the A/D converter into the first and second input memories alternately for each fixed number of sampling operations;

address generating means for generating a common address for accessing the memories of each stage; and

means for calculating the power of each spectral component obtained as the operation result of the last one of the stages to obtain a signal corresponding to the fracture.

4,501,150

ACOUSTIC POLARIMETER

Jean Rouge, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 5, 1983, Ser. No. 482,193

Claims priority, application France, Apr. 6, 1982, 82 05966

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—628 **2 Claims**

1. An acoustic polarimeter for determining the birefringence parameters θ and ϕ of a plate with parallel faces comprising:

an elongated body of isotropic material having parallel end faces made from a meterial propogating acoustic waves of the frequency $\omega 2\pi$;

a means for fixing said plate to one of the end most faces of said elongated isotropic body;

a pair of transducers having their linear transfers axis of polarization at 90° from each other placed at the other end face of said elongated body of isotropic material;

a means for applying electrical signals to said first and second transducers being respectively of the form $\cos \Omega t \cos \omega t$ and $\sin \Omega t \cos \omega t$, where $\Omega/2\pi$ is of a low frequency $(\Omega << \omega)$;

means for receiving through said transducers the signals x_1 and y_1 reflected from the rear face of said birefrigent plate;

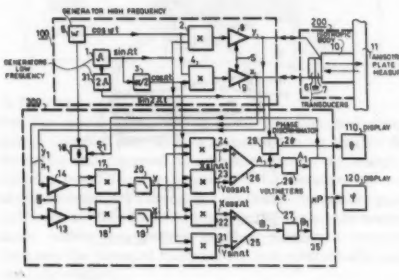
a first phase shifter supplying the signal $\cos(\omega t + \phi)$;

multiplying means for multiplying said signals x_1 and y_1 by the signal produced by said phase shifter;

processing and filtering means for providing signals X and Y wherein said signals X and Y are both multiplied by the signals $\cos \Omega t$ and $\sin \Omega t$;

differential amplifier means supplying an alternate signal A such that $A = X \cos \Omega t - Y \sin \Omega t$;

second differential amplifier means supplying the alternate signal B such that $B = X \cos \Omega t - Y \sin \Omega t$;



a phase meter and display for obtaining ϕ from signal A and a signal $\sin 2\Omega t$;

two ac voltmeter means for receiving said alternating signals A and B at the alternating frequency Ω;

means for supplying digitalized values of amplitude A_1 and B_1;

second phase shift means;

means for generating a signal s_1 for controlling said second phase shift means;

means for computing the zero crossing of said signals being provided to said second phase shift means;

first memory means for storing the value of B_1 at the point at which the zero crossing of signal A_1 occurs;

second memory means for storing the signal A_1 at the point at which B_1 has its zero crossing;

means for computing ϕ based on the formula of arc tan (value stored in said second memory means/value stored in said first memory means);

display means for displaying the value of ϕ.

4,501,151

ULTRASONIC THERAPY APPLICATOR THAT MEASURES DOSAGE

Chris L. Christman, Silver Spring, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 266,379, May 22, 1981, Pat. No. 4,390,026.

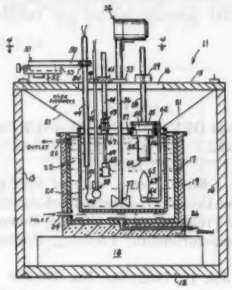
This application Dec. 2, 1982, Ser. No. 446,408

Int. Cl.³ G01H *1/00*

U.S. Cl. 73—646 **11 Claims**

1. A thermal probe for measuring ultrasonic energy density within an acoustic exposure receptacle containing liquid, comprising an elongated support, a body of acoustically absorbing material secured to an end portion of the elongated support,

said body being so configured as to interact with said ultrasonic energy in an omnidirectional manner, a first thermocouple mounted in the interior of said acoustically absorbing body, a reference thermocouple mounted on said support adjacent to and outside of said body; means to permit said body



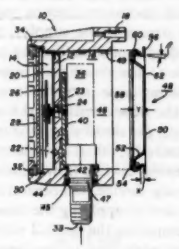
of acoustically absorbing liquid together with said first thermocouple therein, said reference thermocouple and the adjacent position of said support to function when immersed in said liquid; and circuit means differentially connecting the two thermocouples.

4,501,152

TEMPERATURE COMPENSATOR FOR LIQUID FILLED PRESSURE GAUGE

Richard H. Wetterhorn, Fairfield, and Walter J. Ferguson, Middlebury, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 9, 1983, Ser. No. 473,829
Int. Cl.³ G01L *19/14*; G01P *1/02*
U.S. Cl. 73—738 **5 Claims**



1. In a fluid filled pressure gauge including a condition responsive element operative to produce displacement in response to exposed condition changes to which it is sensitive, output means operably connected to said condition responsive element for reflecting the displacement position thereof; a gauge case housing said condition responsive element and said output means and having an internal volume adapted to contain the fluid fill; and compensator means for offsetting temperature induced expansion of the fluid fill, the improvement in said compensator means comprising:

(a) a cover plate adapted to be received in an opening defined in the rear of said case;

(b) an annulus extending laterally away from the inside face of said cover plate and having a negative draft contained on its circumferential surface extending from the distal end of the annulus toward the inside face of said cover plate; and

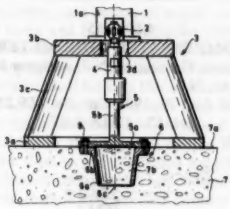
(c) a diaphragm mounted transversely in tension relation folded over said annulus onto the circumference surface thereof to define an enclosed space contained between said cover plate, said diaphragm and said annulus, the outside diameter of the diaphragm on said circumference being sized to provide a friction fit with the inside diameter surface of said coverplate opening for securing said cover plate in said case.

4,501,153

TEST MACHINE FOR DETERMINING CONCRETE STRENGTH

Ferenc Mehes, Báthori u. 24., Budapest, Hungary (1054), and András Mózes, Karpat u. 54., Budapest, Hungary (1133)

PCT No. PCT/HU82/00006, § 371 Date Oct. 4, 1982, § 102(e) Date Oct. 4, 1982, PCT Pub. No. WO82/02949, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 23, 1982, Ser. No. 440,211
Claims priority, application Hungary, Feb. 23, 1981, 432/81
Int. Cl.³ G01N *3/08, 33/38*
U.S. Cl. 73—803 **9 Claims**



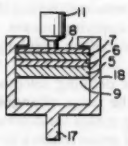
1. A test machine for determining the strength of concrete, comprising a loading unit for loading the concrete until destruction by applying tensile stress to a portion of the concrete, a support for supporting the loading unit against a surface of the concrete to be tested, a breaking cup adapted to be embedded in wet concrete which when hardened is to be tested, said breaking cup being hollow and having an open inner end which is the end embedded deepest in the concrete, the side walls of said cup converging toward said open inner end, and means connecting said loading unit with said cup to draw said cup out of the concrete after the concrete is set, thereby to fracture the concrete along a plane extending across said open inner end of the breaking cup.

4,501,154

METHOD FOR MEASURING AN ADHESIVE STRENGTH OF A MULTI-LAYER MATERIAL

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Apr. 8, 1983, Ser. No. 483,089
Claims priority, application Japan, Apr. 16, 1982, 57-63702
Int. Cl.³ G01N *19/04*
U.S. Cl. 73—827 **3 Claims**



1. A method for measuring adhesive strength of a multi-layer material, said method comprising:

placing a mold on one surface of said multi-layer material to be tested;

casting a brazing metal into said mold to form and secure a resulting cast structure to said one surface of the multi-layer material, said structure including a first column portion connected to and extending substantially upright from said one surface, an intermediate portion extending upright from the upper end of said first column portion and diverging upward in diameter, and a second column portion extending from the upper end of said intermediate portion;

selecting said first column portion to have a length sufficiently small to prevent breakage thereof while measuring the adhesive strength of said multi-layer material

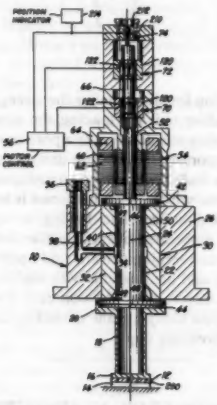
causing one of a pair of chucks of a tension tester to grasp said second column portion of the cast structure and the other of said chucks to grasp said multi-layer material or a holder adapted for mounting therein said multi-layer material; and

applying a tensile force to the respective layers of said multi-layer material in a direction transverse to said layers.

4,501,155
COMPENSATED RHEOMETER

Ronald F. Garritano, Flemington, N.J., assignor to Rheometrics, Inc., Piscataway, N.J.

Filed Jun. 29, 1983, Ser. No. 509,219
Int. Cl.³ G01N 3/22
U.S. Cl. 73—847 **21 Claims**



1. In an apparatus for the evaluation of rheological characteristics of a test specimen through analysis of torsional forces and angular positions in a rotor coupled to the test specimen and suspended within a stator by a low friction bearing for rotation relative to the stator within a range of angular positions about a longitudinal axis of rotation and in a predetermined longitudinal position along the longitudinal axis, the nature of the bearing being such that bearing torque is applied to the rotor at at least some of the angular positions, the apparatus including force-applying means for applying selected torque to the rotor at any of the angular positions, the improvement comprising:

command means for defining selected angular positions of the rotor within the range of angular positions thereof;

position-determining means for determining the actual angular position of the rotor relative to the stator throughout the range of angular positions;

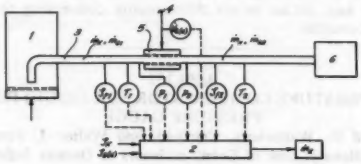
bearing compensation means coupled to the force-applying means, the command means and the position-determining means for actuating the force-applying means in response to compensation information derived from deviations from any one selected angular position of the rotor and a corresponding actual angular position to balance the rotor at the one selected angular position against the bearing torque at the one selected angular position; and

storage means for storing such compensation information for a plurality of selected angular positions of the rotor, whereby compensation information is made available for balancing the rotor against the bearing torque at any selected angular position within the range of angular positions.

4,501,156
METHOD OF AND DEVICE FOR MEASURING A MASS STREAM OF FINELY DIVIDED FINE-GRAINED SOLID FUELS

Horst Kretschmer; Günter Tietze, both of Freiberg; Norbert Beiermann, Brand-Erbisdorf; Manfred Schingnitz, and Peter Goehler, both of Freiberg, all of German Democratic Rep., assignors to Brennstoffinstitut Freiberg, Freiberg, German Democratic Rep.

Filed Jul. 19, 1982, Ser. No. 399,988
Claims priority, application German Democratic Rep., Jul. 17, 1981, 231890
Int. Cl.³ G01F 1/74
U.S. Cl. 73—861.04 **2 Claims**



1. A method of measuring a mass stream of a finely divided, fine-grained solid material conveyed pneumatically by a conveying gas through a supply pipe leading from a dosing container to a gasification reactor or a heater, comprising the steps of passing the mass stream in the supply pipe through a gas mixing device including a porous filtering pipe permeable to gas and impermeable to the dusty fuel, injecting an auxiliary gas through the filtering pipe into the supply pipe at a rate sufficient to reduce the flow density of the mass stream, measuring grain density ρ_K, gas density $\rho_{G(N)}$ at normal conditions, temperature T_1, pressure P_1, initial flow density ρ_{Π} of the mass stream before the mixing device, flow density $\rho_{\Pi 2}$ of the mass stream after the mixing device, temperature T_2 and pressure P_2, after the mixing device; applying the measured parameters to a computer for computing the desired value m_K of the mass stream per a time unit according to the formulas

$$m_K = \dot{V}_{G(2)} \cdot \frac{\rho_K(\rho_{\Pi} - \rho_{G1}) \cdot (\rho_{\Pi 2} - \rho_{G2})}{(\rho_K - \rho_{G1}) \cdot (\rho_{\Pi} - \rho_{\Pi 2})} \cdot \left[1 + \frac{P_1}{P_2} - 1\right)\left(\frac{\rho_K - \rho_{\Pi}}{\rho_K - \rho_{G1}}\right)\Bigg]^{-1} \tag{2}$$

$$\rho_{G1} = \rho_{G(N)} \cdot \frac{P_1}{P_N} \cdot \frac{T_N}{T_1} \tag{2.1}$$

$$\rho_{G2} = \rho_{G(N)} \cdot \frac{P_2}{P_N} \cdot \frac{T_N}{T_2} \tag{2.2}$$

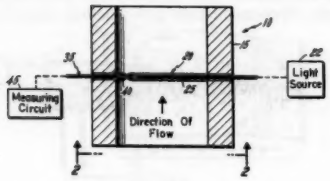
$$\dot{V}_{G(2)} = \dot{V}_{G(N)} \cdot \frac{T_2}{T_N} \cdot \frac{P_N}{P_2} \tag{2.3}$$

wherein ρ_{G1} is the density of the conveying gas, ρ_{G2} is the density of the combined conveying and auxiliary gases after the mixing device, and $V_{G(2)}$ is the rate of flow of the injected gas.

4,501,157
VORTEX SHEDDING FLOW MEASURING TRANSDUCER

Robert H. Perkinson, Somers; Brian G. Donnelly, West Suffield, and Carl S. Dudash, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 15, 1982, Ser. No. 441,886
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.24 2 Claims



1. A digital flow measuring transducer comprising a conduit for accommodating a flow of fluid therethrough, said transducer being characterized by:

a first optical fiber cantilevered to a wall of said conduit, said first optical fiber conducting a continuous optical signal from the exterior of said conduit to the interior thereof, flow past said first optical fiber inducing the periodic formation and shedding of vortices therefrom, said vortex shedding causing a vibration of said first optical fiber; and

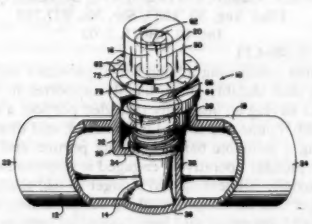
a second optical fiber disposed in said conduit and spaced from said first optical fiber for receiving said optical signal after a modulation thereof by said first optical fiber, said second optical fiber being periodically aligned with said first optical fiber as a result of the vibration thereof to effect said modulation of said signal at said second optical fiber, the frequency of said modulated signal being indicative of the rate at which said vortices are shed from said first optical fiber and the rate of fluid flow through said conduit;

said first and second optical fibers at adjacent ends thereof being optically opaque with the exception of aligned transparent slit apertures therein, the transmission of said optical signal from the slit aperture of said first optical fiber to the slit aperture of said second optical fiber effectively reducing the threshold vibratory amplitude of said first optical fiber required for detection of said vortex shedding by said flow measuring transducer.

4,501,158
LIQUID FLOW INDICATOR AND VALVE DEVICE

Robert W. Pelikan, 245 Alvarado Ave., Los Altos, Calif. 94022

Filed Jul. 29, 1983, Ser. No. 518,367
Int. Cl.³ G01F 1/26
U.S. Cl. 73—861.58 2 Claims



1. A device for controlling the flow of liquids in a conduit comprising in combination:

housing means defining a path along which a flow of liquid is confined, said housing means including a clear portion,

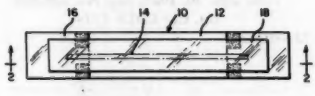
a float in said housing means visible through said clear portion of the housing means and being movable between a closed position wherein it blocks the flow of liquid in a reverse direction along said path and a plurality of open positions wherein it allows the flow of liquid in a forward direction along said path, and

means associated with said float for indicating a forward flow of liquids through the device as well as the rate of forward flow of liquid, said means for indicating the rate of forward flow of liquids consisting of (a) indicia on said float which is visiable through said clear portion of the housing and is adapted to indicate the displacement of the float from its position, said displacement being proportional to the rate of flow of the liquid, and (b) a calibrated clear ring having an inner circular surface which is contiguous with said clear portion of the housing, a radial circular surface extending perpendicularly away from said inner circular surface, and a reflective beveled circular surface connecting said inner and radial circular surfaces, one of said inner and beveled circular surfaces having a circular indicia line there along and said radial circular surface having a plurality of calibrated radial lines thereon whereby an individual looking through said radial circular surface can see the indicia on said float via the beveled surface and the inner circular surface and determine the flow rate of liquid through the device by relating the indicia on the float to the calibrated indicia on the radial circular surface of the circular indicia line on one of said inner circular surface and beveled circular surface.

4,501,159
CONTACT GAUGE AND METHOD OF EMPLOYING SAME

Mircea Arcan, 42/22 Tagore St., Tel-Aviv, Israel

Filed Aug. 20, 1982, Ser. No. 409,836
Int. Cl.³ G01L 1/06
U.S. Cl. 73—862.53 25 Claims



19. A contact gauge adaptable for determining pressure conditions, said contact gauge including a thin plastic sheet which is not-completely-elastic, is optically isotropic, exhibits and memorizes an induced birefringence, and an elongate flexible load transmitting member attached to said sheet for indenting and inducing uniaxial deformation in the plane of the sheet in response to a compressive force applied to said member.

4,501,160
FORCE TRANSDUCER

Michael K. Johnson, 2915 Cherokee Ave., Santa Rosa, Calif. 95401

Filed Mar. 31, 1983, Ser. No. 481,076
Int. Cl.³ G01L 1/22
U.S. Cl. 73—862.65 27 Claims

1. A transducer comprising

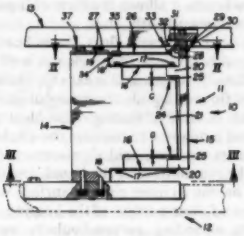
a base,

a load receiving member adapted to have a load imposed thereon,

a sensing tip on said member,

flexure means for mounting said member in substantial isolated and floating relationship on said base to permit independent flexing movements of said member relative to said base, said flexure means comprising a pair of leaf springs connected between said base and said member to

form a parallelogram arrangement therewith and wherein said base has a reduced body portion and said member has a pair of extension overlying said body portion, each of said leaf springs being releasably interconnected between said base and a respective one of said extensions,



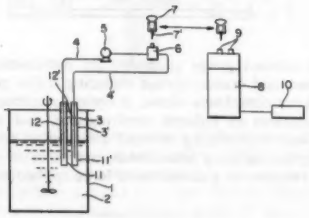
sensing means, including a flat cantilever spring having a first end mounted in cantilevered relationship on said base and having a free second end positioned adjacent to said member for directly engaging said sensing tip in point contact to sense the load imposed on said member, for producing a variable electrical output signal in response to the magnitude of said load.

4,501,161

AUTOSAMPLER

Isao Endo, Kokubunji; Teruyuki Nagamune, Wako, and Ichiro Inoue, Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed Jan. 20, 1983, Ser. No. 459,598
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—863.24 **3 Claims**



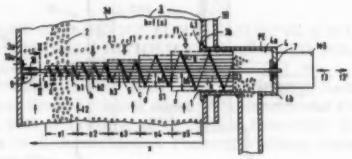
1. An autosampler for sampling a clarified test solution from a suspension to be tested, which comprises two filtering tubes which are adapted to be immersed in the suspension, a circulator connected in series with one filtering tube, a sampling cell for sampling test solution, and the other filtering tube, the sampling cell being connected between the circulator and the other filtering tube, the circulator being operable to draw a test solution from the one filtering tube, whereby the test solution is filtered and clarified, to deliver the filtered and clarified test solution to the sampling cell, whereby the test solution is sampled, and to return the residual test solution from the sampling cell to the suspension through the other filtering tube, and said circulator being operable to periodically reverse the flow direction of the test solution so that the filtering tubes do not become blocked.

4,501,162

SAMPLE-TAKING APPARATUS FOR A CONTAINER, CONTAINING A BULK MATERIAL FEED

Wolfgang Mathewes, Giessen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,567
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206323
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—863.83 **20 Claims**



1. Sample-taking apparatus, comprising a container for bulk material feed, said container having an upper cover region, a lower discharge region and a side wall having a discharge opening formed therein, the bulk material feed flowing at least discontinuously from said upper cover region to said lower discharge region of said container, an exposed sample-taking worm being attached to said side wall and projecting through said discharge opening into the feed for conveying bulk material samples from the feed by rotating, a rotary drive connected to said sample-taking worm, and a collecting device integral with said container, said worm having a shaft with an end, at least said end being immersed in the feed, said worm having worm threads formed thereon with surfaces forming an imaginary surface of projection extended normal to said worm shaft, said worm thread surfaces forming worm segments with increasingly smaller conveying surfaces as seen in direction toward increasing depth of immersion of said worm into the feed, during sample-taking in a quasi-stationary condition of the feed, said worm threads accumulating layered hollow cylindrical bulk material segments between said worm threads in subsets corresponding to worm segments from any of said worm threads having a given spiral height to an adjacent one of said worm threads having a larger spiral height as seen in direction from said end of said shaft to said discharge opening, said subsets being representative of the bulk material of said respective segments of said worm, the bulk material feed being a bed of a bulk material filter, through which fluids to be cleaned flow in a given direction, the filter bed having respective feeding and discharge filter sides, said sample-taking worm projecting into the filter bed substantially perpendicularly to the fluid flow direction.

4,501,163

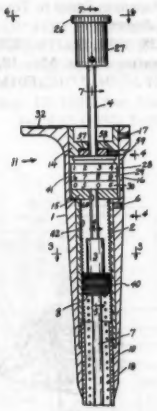
ADJUSTABLE MICRO-DISPENSING LIQUID PIPET

Bruce R. MacDermott, 2835 Prince St., Berkeley, Calif. 94705, and Justin J. Shapiro, 620 Hearst Ave., Berkeley, Calif. 94710

Filed Aug. 30, 1983, Ser. No. 527,783
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—864.13 **8 Claims**

1. A pipet comprising a main barrel provided with an axial operating shaft slidably and rotatably supported in the barrel, said barrel having an internally threaded portion, a dispensing tip yieldably connected to said main barrel, said dispensing tip comprising a yieldable barrel-coupling portion and a conduit portion, a plunger operatively engaged in said conduit portion, means coaxially connecting said plunger to said shaft, whereby the plunger can be reciprocated by reciprocating said shaft, and means to disengage said barrel-coupling portion from said barrel at times responsive to axial force exerted on said shaft, wherein said tip includes annular internal shoulder means, wherein said disengaging means comprises abutment means

moving with said shaft and being engageable with said shoulder means to transmit said axial force, and wherein said abutment means is engageable with said shoulder means to normally limit the discharge movement of said plunger in said conduit portion, and cooperating stop means to limit intake movement of said plunger in said conduit portion, said stop means comprising an abutment stop element secured on said shaft, an externally threaded abutment stop sleeve member slidably and non-rotatably engaged on said shaft and being threadedly engaged with said internally threaded portion inside said barrel above said abutment stop element, and spring means biasing said abutment stop element upwardly into engagement with said stop sleeve member to establish the normal elevated position of the plunger in said conduit portion, whereby said normal elevated position can be varied by rotating the shaft relative to said main barrel, and wherein said shaft has a non-circular cross-sectional upper portion and said stop sleeve member has an axial non-circular bore slidably and nonrotatably fitting on said non-circular shaft portion, the top end of said shaft portion having a hollow bushing member axially secured thereon for at times manually rotating said shaft, a top push-button disc member overlying the top end of said hollow bushing member, and means rotatably and detachably securing said disc member on said bushing member.



4,501,164

AUTOMATIC SAMPLING ARRANGEMENT

Trevor J. Stockdale, Cambridge, and John E. Churchill, Haslingfeld, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

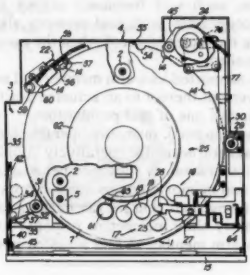
Filed Aug. 5, 1983, Ser. No. 520,877

Claims priority, application United Kingdom, Aug. 20, 1982, 8223963

Int. Cl.³ G01N *35/04, 35/06*

U.S. Cl. 73—864.25 **11 Claims**

1. An automatic sampling arrangement for supplying liquid samples to an analytical instrument comprising a compartment within which a sample carrier in the form of a turntable may be located, the turntable having a plurality of locations for sample containers arranged on a circle coaxial with the axis of rotation of the turntable, and a sampling mechanism for aspirating a sample from a sample container when the turntable is indexed to bring one of the sample locations in registration therewith, characterized in that the arrangement is constructed so that the turntable is inserted, in operation, into the compartment in a direction perpendicular to its axis of rotation, that the turntable is located by three bearing surfaces which engage the circumference of the turntable, that a driving assembly is provided which engages said circumference to rotate the turntable, and that one of the bearing surfaces is movable from a first position



in which it engages said circumference to a second position to allow insertion or withdrawal of the turntable.

4,501,165

CROSS ARM MECHANISM IN A PUSHBUTTON TUNER

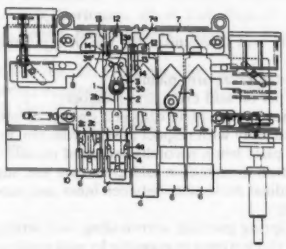
Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,545

Claims priority, application Japan, May 18, 1981, 56-70485[U]; May 18, 1981, 56-70486[U]; May 18, 1981, 56-70487[U]; May 18, 1981, 56-70488[U]; May 27, 1981, 56-75860[U]; May 28, 1981, 56-76581[U]; May 28, 1981, 56-76582[U]; May 28, 1981, 56-76583[U]; May 29, 1981, 56-77397[U]

Int. Cl.³ H03J *5/12*

U.S. Cl. 74—10.33 **9 Claims**



1. A tuner operated by pushbuttons, comprising:

a plurality of cross arm members supported for movement parallel to a first direction;

a pushbutton slidably supported on one end of each said cross arm member;

a cross arm slide member slidably supported on each said cross arm member and operatively coupled to the associated pushbutton;

a fixing plate supported on each said cross arm member, said fixing plate having therein an engaging hole and a slit which extends into said fixing plate from one end thereof and which communicates with said engaging hole, said fixing plate having pressure receiving surfaces at said one end thereof on opposite sides of said slit;

a frequency setting member movably supported in said engaging hole of each said fixing plate, said cross arm slide member having pressing portions thereon which are cooperable with said pressure receiving surfaces on said fixing plate as said cross arm slide member is moved relative to said cross arm member so as to pinch said one end of said fixing plate and thereby narrow said slit and said engaging hole in a manner clamping said frequency setting member

against movement relative to said fixing plate and said cross arm member;

a memory slide member supported for movement in a second direction approximately perpendicular to said first direction, each said frequency setting member having means cooperable with said memory slide member for effecting movement thereof when the associated pushbutton is pushed;

a movably supported kick arm member and means for effecting movement thereof to an actuated position in response to pushing of one of said pushbuttons;

a rotatably supported, manually operable tuning shaft; and

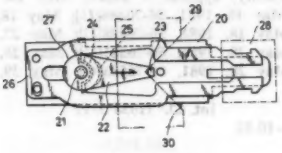
clutch means for normally operatively coupling said tuning shaft and said memory slide member so as to effect movement of said memory slide member in response to rotation of said tuning shaft, and for disengaging said tuning shaft and memory slide member in response to movement of said kick arm member to said actuated position.

4,501,166

CROSS ARM MECHANISM IN A PUSHBUTTON TUNER

Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,889
Claims priority, application Japan, Jun. 30, 1981, 56-100480
Int. Cl.³ H03J *5/12*
U.S. Cl. 74—10.33 **2 Claims**



1. A cross arm mechanism for use in a pushbutton tuner, comprising:

an elongated cross arm member;

a setting pin on said cross arm member;

a frequency setting plate disposed on top of and extending longitudinally with respect to said cross arm member, said setting plate being pivotally mounted on said setting pin;

a pushbutton mounted on said cross arm and supported for longitudinal movement between inner and outer positions thereon;

a setting spring partially surrounding said setting plate and having end portions engageable by said pushbutton so that said setting spring is movable between clamping engagement with said setting plate when said pushbutton is in said inner position and non-clamping engagement with said setting plate when said pushbutton is in said outer position whereby said setting plate is fixed with respect to said cross arm member when said pushbutton is in said inner position and is freely rotatable with respect to said cross arm member when said pushbutton is in said outer position;

a downwardly extending first protuberance on the bottom surface of said setting plate, said first protuberance having an arcuate wall extending laterally with respect to said cross arm member;

said cross arm member having an elongated guide hole extending laterally thereon and into which said protuberance extends, said guide hole having symmetrical, oppositely inclined lateral wall sections which are engageable with said arcuate wall of said protuberance and which wall sections are joined to each other at a central juncture located on the longitudinal center line of said cross arm;

an upwardly extending second protuberance on said setting plate at a location thereon remote from said setting pin;

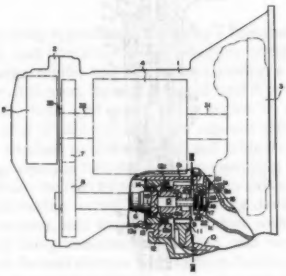
a memory slide disposed above and extending transversely to said cross arm and said setting plate, said memory slide having a notch that opens in a direction toward said pushbutton and narrows to a bottom, said second protuberance being received in said notch so that when said pushbutton is in its inner position and said second protuberance is located at the bottom of said notch, said setting plate is located in a position in which said first protuberance is centered in said guide hole.

4,501,167

TRANSMISSION POWER OUTPUT SHAFT ASSEMBLY WITH BEARING LUBRICANT COLLECTING AND DIRECTING MEMBER

Tadashi Saito, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1982, Ser. No. 425,259
Claims priority, application Japan, May 18, 1982, 57-84624
Int. Cl.³ F16H *57/04, 57/02;* **F01M** *9/00*
U.S. Cl. 74—467 **3 Claims**



1. A power output shaft assembly for a transmission comprising a transmission casing, a rotational speed changing mechanism, and a differential mechanism comprising a differential power input gear, said transmission casing including a casing portion which forms a partition for separating a space for housing said differential mechanism from a space for housing said rotational speed change mechanism except a cylindrical hole bored therethrough, comprising:

a power output shaft for receiving and outputting rotary power output of said rotational speed changing mechanism, said power output shaft being formed with a first lubricant passage one end of which opens to one end of said power output shaft and the other end of which opens to a point on a side surface of said power output shaft;

a power output gear at said one end of said power output shaft, said one end of said power output shaft and an axial end surface of said power output gear on the side of said one end of said power output shaft being positioned closely to oppose a part of said casing wall portion forming said partition;

a bearing for rotatably mounting said power output shaft to said transmission casing, said bearing being located close to the other axial end surface of said power output gear and supporting part of said power output shaft proximate to said power output gear; and

a lubricant collecting and directing member mounted to said part of said casing portion forming said partition, comprising a cylindrical base portion adapted to be fitted into said cylindrical hole of said casing portion forming said partition and a tubular extension which extends from said cylindrical base portion into said one end of said first lubricant passage formed in said power output shaft, said cylindrical base portion being formed with a partial cutaway communicated with an end of a passage in said tubular extension;

wherein a surface of said casing portion forming said parti-

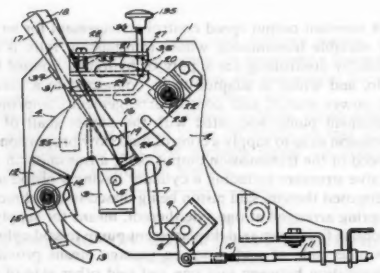
tion which defines said space for housing said differential mechanism is formed with a cutaway portion which at least partially aligns with said cutaway formed in said base portion of said lubricant collecting and directing member and adapted to collect lubricant stirred up by said differential power input gear and to conduct the collected lubricant toward said cutaway portion formed therein.

4,501,168

ADJUSTABLE STOP FOR POSITION CONTROL LEVER FOR DRAFT LOAD SENSING SYSTEM

Donald E. Chaulk, New Berlin, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Sep. 13, 1982, Ser. No. 417,700
Int. Cl.³ G05G *5/00*
U.S. Cl. 74—526 **6 Claims**



1. In a tractor, a control means for a hydraulic implement lift system comprising,

a control console including a generally upright sidewall,

a position control lever pivotally mounted on said console for a pivotal movement about a transverse axis, said lever being spaced from said sidewall,

a lever stop pivotally mounted on said sidewall having

a first upright handgrip portion spaced from said sidewall with an abutment part in abutable relation to said control lever to limit the pivotal movement of the latter in one direction, and

a latch engaging portion spaced axially from said handgrip portion and extending upwardly intermediate said handgrip portion and said sidewall, said latch engaging portion including an arcuate upper edge,

a support bracket secured to said sidewall and including a top wall and a downwardly extending flange spaced from said sidewall,

a latch disposed between said flange and said sidewall and including a latch element engageable with said arcuate upper edge of said latch engaging portion of said lever stop,

pivot means pivotally supporting said latch on said bracket in underlying relation to said top wall thereof,

resilient biasing means on said console engaging said latch and urging the latter to rotate on said pivot means whereby said latch element engages said latch engaging portion to releasably restrain said lever stop against pivotal movement and

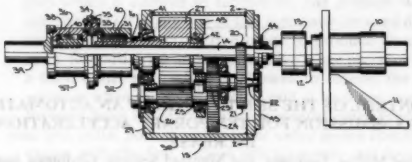
a manual control element connected to said latch and operable to pivot the latter about said pivot means in opposition to said biasing means to release latch from said latch engaging portion.

4,501,169

TWO SPEED GEAR DRIVE WITH REVERSIBLE INPUT AND UNIDIRECTIONAL OUTPUT

John J. Stilin, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Jan. 17, 1983, Ser. No. 458,488
Int. Cl.³ F16H *5/52*; F16D *41/04*
U.S. Cl. 74—812 **4 Claims**



1. A gear drive apparatus, comprising:

a pair of coaxial one-way clutches each having an inner race and an outer race, the outer races of the clutches being joined together and the joined outer races being joined to a stub shaft;

a high speed shaft connected to the inner race of one of said clutches;

a reversible prime mover coupled to said high speed shaft;

a quill shaft surrounding said high speed shaft and connected to the inner race of the other of said clutches; and

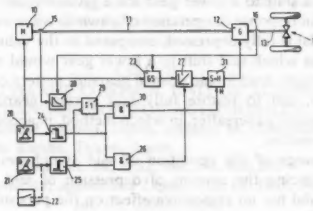
reversing reduction gearing joining the high speed shaft and the quill shaft.

4,501,170

METHOD OF CONTROLLING DOWNSHIFT AFTER BRAKING IN AUTOMATIC TRANSMISSIONS OF MOTOR VEHICLES

Alfred Müller, Gröbenzell; Dieter Schaller, Neubulach, and Manfred Schwab, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,171
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127931; Oct. 8, 1981, 3139985
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—866 **4 Claims**



1. Method of controlling an automatic transmission of a motor vehicle with respect to operation of the vehicle brake control in which the gear ratio of the transmission is raised to improve braking, comprising the steps of:

raising the gear step-down ratio of the transmission (**12**) from a previously set value to a raised value in response to actuation of the brake control (**21**) during a first period which terminates either when the brake control has been released or when the speed of the motor of the vehicle exceeds a speed value specified by a predetermined characteristic curve with reference to the transmission output speed, whichever occurs first, the gear ratio being raised during said first period by an amount limited only by the available gear ratio range, reaching of said specified speed

value, and the available time for raising said ratio prior to release of said brake pedal and

after the termination of said first period maintaining the gear ratio which is in use at the end of said first period for the duration of a second period which terminates with the next actuation of the acceleration control (20) of the vehicle, after which the normal control of the transmission of the vehicle is restored.

4,501,171

CONTROL OF THE SHIFT POINTS OF AN AUTOMATIC TRANSMISSION FOR TEMPORARY ACCELERATION INCREASE

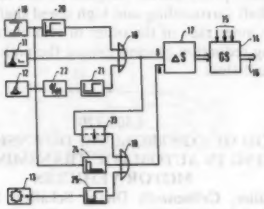
Alfred Müller, Leonberg, and Manfred Schwab, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,222

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1981, 3139838

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—866 **2 Claims**



1. Method of controlling the provision of a substantial discrete offset in a normal gearshift pattern of a vehicular automatic transmission interposed between an internal combustion engine and drive wheels of a vehicle, said engine having an accelerator pedal for increasing and reducing the power output of the engine during driving of the vehicle, said offset being constituted to put quickly at lower value the vehicle speed at which a shift to a lower gear for a given engine load is produced in response to operation of a switch when said accelerator pedal is fully depressed, compared to the value of vehicle speed at which said shift to a lower gear would occur at the same engine load in said normal gearshift pattern of said transmission, and to restore fully said normal gearshift pattern automatically thereafter, in which method, in accordance with the invention,

a change of the condition of said switch resulting from reducing the amount of depression of said accelerator pedal has no responsive effect on the persistence of said offset;

said offset is also provided when the engine load oversteps a first predetermined threshold value of said engine load;

said offset is also provided when said accelerator is depressed at a rate that exceeds a predetermined rate;

said offset is terminated when a predetermined time has elapsed since said offset was provided;

said offset is terminated when the load of said engine has fallen below a second predetermined value of engine load;

said offset is terminated when the speed of said engine has increased beyond a first predetermined threshold value of engine speed, and

said offset is terminated when the speed of said engine has decreased beyond a second predetermined threshold value of engine speed.

4,501,172

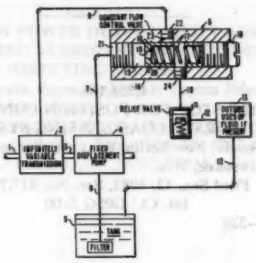
HYDRAULIC SPEED CONTROL ARRANGEMENT FOR AN INFINITELY VARIABLE TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Aug. 16, 1982, Ser. No. 408,422

Int. Cl.³ B60K *41/16*; F16H *15/00*

U.S. Cl. 74—867 **5 Claims**



1. A constant output speed control arrangement for an infinitely variable transmission whose transmission ratio is controllable by controlling the supply of hydraulic control fluid thereto, and which is adapted to be connected to a variable speed power source, said control arrangement comprising a displacement pump associated with the output shaft of said transmission so as to supply a control fluid flow proportional to the speed of the transmission output shaft, a transmission control valve structure including a cylinder having a piston movably disposed therein, said piston being biased in one direction by a spring arranged at one side thereof, means for supplying said control fluid from said displacement pump to said cylinder at the other side of said piston, a passage means providing communication between said one and said other side of said piston and having a flow control orifice disposed therein for permitting passage of a desired amount of control fluid, said cylinder having a control opening arranged at said one side of said portion and in communication with said transmission for controlling its transmission ratio, said control opening being adapted to be closed by the piston when said piston is moved by a larger than desired amount of control fluid against the force of said spring for changing the transmission ratio so as to reduce transmission output shaft speed and said control opening, when being opened by said piston upon supply of less than said desired amount of control fluid, providing for the supply of control fluid to said transmission for a change of the transmission ratio so as to increase transmission output shaft speed, and a relief valve structure associated with said valve for maintaining within said valve a predetermined fluid pressure sufficient to operate the speed change control mechanism of said infinitely variable transmission.

4,501,173

FLUID DELIVERY CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION

Ernst-August Honig, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 455,961

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148453

Int. Cl.³ B60K *41/06*

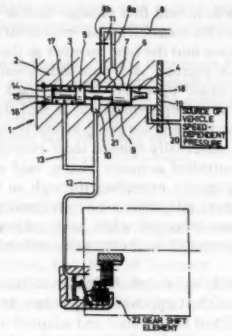
U.S. Cl. 74—868 **8 Claims**

1. A control for effecting variable fluid delivery to a gearshift element of an automatic transmission, for controlling actuation of said gearshift element, comprising:

fluid delivery means for supplying a pressurized fluid to said gearshift element, said delivery means having a throttle means arranged therein;

bypass means, arranged to bypass said throttle means, for delivering said pressurized fluid to said gearshift element;

a valve, arranged in said bypass means, having a piston moveable between an open position, for permitting flow through said bypass means, and closed position for blocking said flow;



means communicating with said delivery means, downstream of said throttle means, for supplying a first pressure signal to said valve for acting on said piston, for urging said piston into said open position; and

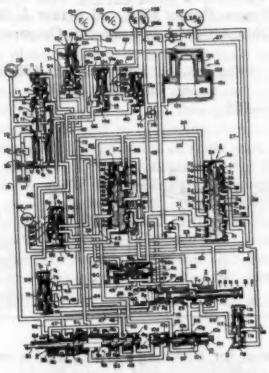
means for supplying a second, vehicle speed-dependent pressure signal to said valve for acting on said piston in opposition to said first pressure signal for urging said piston into said closed position.

4,501,174

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 16, 1982, Ser. No. 348,837
Claims priority, application Japan, Feb. 17, 1981, 56-20827
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—869 **5 Claims**



1. A hydraulic control system for an automatic transmission having a first friction unit to be engaged for all of forward drive ranges, a second friction unit and a third friction unit, the hydraulic control system comprising:

pressure regulator valve means for producing a line pressure;

manual valve means coupled with said pressure regulator valve means to receive the line pressure, said manual valve means having a valve body formed with a bore and a spool slidably disposed within said bore for movement to an automatic forward drive range, at least one manual forward drive range and a reverse drive range,

said manual valve means being formed with a first outlet port which is allowed to receive the line pressure when said spool is set in one of said automatic forward drive range and said at least one manual forward drive range to provide a forward drive range pressure, a second outlet port which is allowed to receive the line pressure when said spool is set in any one of said automatic forward drive range and said reverse drive range to produce an automatic forward drive and reverse drive range pressure, and a third outlet port which is allowed to receive the line pressure when the spool is set in said at least one manual forward drive range to produce a manual range pressure,

said first outlet port of said manual valve means communicating with the first friction unit to supply said forward drive range pressure;

first shift valve means for effecting a shift between a gear ratio and another gear ratio, said first shift valve means having an inlet port communicating with said first outlet port of said manual valve means to receive said forward drive range pressure, an outlet port communicating with the second friction unit and a drain port, said first shift valve means being shiftable between a downshift state wherein said outlet port thereof is isolated from said inlet port thereof and is allowed to communicate with said drain port thereof and an upshift state wherein said outlet port thereof is allowed to communicate with said inlet port thereof and is isolated from said drain port thereof;

means defining a conduit having one end connected to said second outlet port of said manual valve means; and

second shift valve means for effecting a shift between said another gear ratio and still another gear ratio, said second shift valve means having an inlet port connected to the other end of said conduit, an outlet port communicating with the third friction unit and a drain port, said second shift valve means being shiftable between a downshift state wherein said outlet port thereof is isolated from said inlet port thereof and is allowed to communicate with said drain port thereof and an upshift state wherein said outlet port thereof is allowed to communicate with said inlet port thereof and is isolated from said drain port thereof,

said second shift valve means having a second inlet port communicating with said third outlet port of said manual valve means to receive said manual range pressure and being urged in response to said manual range pressure to shift into said downshift state thereof.

4,501,175

SPEED CHANGE CONTROL UNIT OF AUTOMATIC TRANSMISSION FOR AUTOMOBILES

Takumi Tatsumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 435,100
Claims priority, application Japan, Oct. 16, 1981, 56-165950
Int. Cl.³ B60K *41/22*
U.S. Cl. 74—869 **3 Claims**

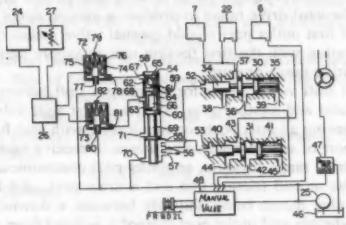
1. In an automatic transmission for automobiles having hydraulic servos for being selectively operated singly or in groups for changing the transmission ratio, an improved speed change control means comprising:

a plurality of hydraulic transfer valves operable for supplying pressurized hydraulic fluid to said servos from a source of pressurized hydraulic fluid;

hydraulic actuating means for each of said transfer valves;

a distributing valve for selectively distributing pressurized hydraulic fluid from said source of fluid to the respective hydraulic actuating means, said distributing valve having a plurality of spool means respectively movable through different maximum length strokes, each being movable through its respective stroke when supplied with pressur-

ized fluid, and said spool means being connected for being moved through a stroke which is the sum of the maximum length strokes of a number of said spool means when the respective spool means of said number of spool means is supplied with pressurized fluid, a valve member connected to said spool means for being moved by said spool means through a stroke corresponding to the stroke through which the spool means is moved, and a plurality of pressure fluid passages and a pressure fluid supply port and a pressure fluid discharge port in said distributing valve, the number of fluid pressure passages being at least one more than the number of spool means, and at least some of said pressure fluid passages being connected to



respective ones of said hydraulic actuating means and any remaining fluid passages being for connection to means for carrying out other transmission functions, the movement of said valve member by said spool means controlling the fluid flow between said supply and discharge ports and one or more of said pressure fluid passages in accordance with the stroke of said valve member according to whether one or more of said spool means is moved; and

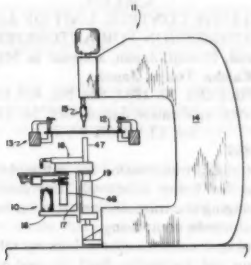
a plurality of control valve equal to number to the number of spool means and each connected to a corresponding spool means for supplying pressurized hydraulic fluid to the respective spool means in response to the speed condition of the automatic transmission.

4,501,176

AUTOMATIC THREADED NUT INSTALLATION AND TORQUING SYSTEM

Richard L. Sanders, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 28, 1983, Ser. No. 508,583
Int. Cl.³ B25B *23/14*
U.S. Cl. 81—470 **6 Claims**



1. An automatic nut installation and torquing system adapted to install a nut on a threaded fastener shank inserted through an opening in a workpiece with the fastener located at a nut installation position, said system comprising:

a first passage means for transferring in a substantially horizontal direction a plurality of nuts in seriatim order and predetermined orientation from a supply source to a first nut location;

a substantially vertical and rigid tube member having an upper and lower end, both of which ends are open, said tube member adapted and sized to contain a seriatim stack of a plurality of nuts in the same individual orientation of said nuts as in said first passage means;

a first means for transferring an individual nut from said first nut location into the tube member as the lowermost nut in said stack thereof, said nuts individually progressing in seriatim order upwardly in said stack to a second nut location as the uppermost nut in said stack;

a nut application and torquing means including a vertically oriented, externally splined shaft extending from a pneumatic controlled actuator piston, said externally splined shaft engagingly extending through an internally splined drive means adapted to be rotationally driven about a fixed plane whereby when said internally splined drive means is rotated, said externally splined shaft is also rotated;

said externally splined shaft further including proximate the end of the shaft opposite the piston a hollowed nut drive socket affixed to the shaft and adapted to rotate with said shaft when said shaft is rotated by said internally splined drive means, and a nut catching pin means telescopically interconnected to said shaft and through said nut drive socket, said nut catching pin means adapted to retain a nut through gravitational forces when placed thereon and free of the nut drive socket until said pin means is moved telescopically into said nut drive socket by the end of the threaded fastener shank the nut is to be engaged with whereby said nut drive socket drivingly engages the nut;

second means for transferring a nut from the second nut location at the top of said stack to a location on said nut catching pin means;

a torque motor means;

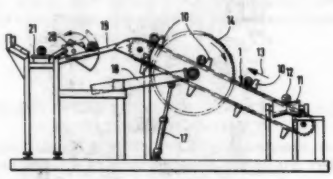
and a torque transfer means interconnecting said torque motor means and said internally splined drive means whereby torque generated by said motor means is delivered to a nut engaging a threaded fastener through rotation of said nut drive socket.

4,501,177

EDGE TRIMMING AND SCRAP DISPOSAL SYSTEM

Russell J. Logan, Pepper Pike, and Arthur J. Glass, Newbury, both of Ohio, assignors to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 26, 1982, Ser. No. 436,857
Int. Cl.³ B23D *19/06*
U.S. Cl. 83—105 **13 Claims**



1. A system for trimming the edges of a metal strip and disposing of the edge trimmings comprising:

a cutting assembly having two parallel rotary cutting knives, one positioned mainly below the strip to be cut and one positioned mainly above the strip to be cut, each rotary knife having an adjacent backup roll mounted on the same central axis, the backup roll, adjacent the knife located mainly below the strip, being positioned on the side of the knife furthest from the center of the strip and the backup roll, adjacent the knife located mainly above the strip,

being positioned on the side of the knife closes to the center of the strip;

a one-piece, straight, tubular chute having a constant cornerless cross-section through which trimmings pass from said cutting assembly to a chopping device, the end of said chute adjacent said cutting assembly being configured so that said chute end abuts said cutting assembly and together with said cutting assembly encloses said edge trimmings,

chopping means through which trimmings from said chute means pass and are severed into small lengths;

means for attaching the chutes to the cutting assembly;

means for driving said trimmer; and

means for driving said chopping means.

4,501,178

DEVICE FOR SEVERING ROUND TIMBER

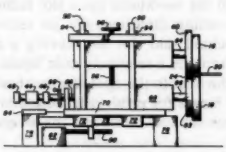
Siegmar Gönner, Oberkirch, Fed. Rep. of Germany, assignor to Gebrüder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck" , Oberkirxh, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,639

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207547

Int. Cl.³ B27B *25/04*

U.S. Cl. 83—107 **5 Claims**



1. A device for severing round timber, comprising a rotary circular saw having a sectional plane and teeth and cutting round timber into sections, and tranversal feeding means for feeding round timber being processed towards said saw and further from said saw, said feeding means having a feed-in end and a discharge end and including a plurality of rotatable conveying chains arranged side by side, said conveying chains being arranged in at least one group positioned at one side of the sectional plane of the saw and in at least another group positioned at an opposite side of the sectional plane of the saw, the conveying chains of said one group and the conveying chains of said another group being arranged relative to each other so that they extend in a feeding direction from said feed-in end to said discharge end at an acute angle with respect to the sectional plane of the circular saw so that the conveying chains of said one group diverge from the conveying chains of said another group and the sections completely separated from each other by said circular saw and further fed by said one and another group, respectively, are moved away from each other, whereby a contact of cut surfaces of said sections with the saw teeth in a circle area of the saw, after the cutting has been completed, is prevented.

4,501,179

COMPOUND DIE ASSEMBLY

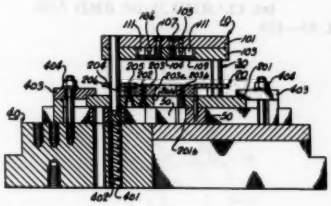
Satoshi Iwata, Tokyo, Japan, assignor to Tetsutaro Iwata, Japan

Filed Sep. 8, 1982, Ser. No. 415,978

Int. Cl.³ B26F *1/14*

U.S. Cl. 83—124 **7 Claims**

1. In a compound die assembly including an upper punch unit having a punch holder, at least one punch element, a blanking die element, and a knockout plate; a lower die unit having a die holder, a blanking punch element corresponding to said blanking die element and having at least one die hole corresponding to said at least one punch element, said die holder having at least one slug clearance hole corresponding to said at least one die hole, and a stripper plate; and a guide post means for maintaining operative vertical alignment of said punch unit and said die unit; the improvement which comprises the top end portion of each guide post means being fixed to said punch holder with the lower end portion thereof extending through a respective hole formed in said die holder, said blanking die and punch elements being respectively outer and inner pieces formed from a single plate by wire-cut electro-discharge machining and being directly fixed to said punch and die holders respectively, said knockout plate and said stripper plate being respectively inner and outer pieces formed



from a single plate by wire-cut electro-discharge machining and being elastically supported with respect to said punch and die holders respectively, a mount means to be removably mounted on a press bolster and having a flat top surface on which said die unit and punch unit are supported, said mount means having a set of holes for receiving the lower ends of said guide post means, a plurality of load-supporting elements being fixed to a bottom surface of said die holder and near the edge of said at least one slug clearance hole of said die holder to form a slug-accumulating space between said die holder and said mount means which communicates with an external space surrounding said die holder, and clamping means fixing said die holder onto said mount means.

4,501,180

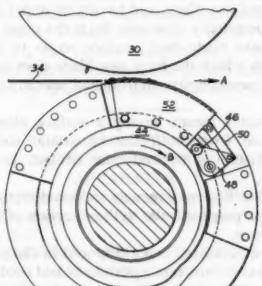
ROTARY DIE-CUTTING

Thomas D. Bishop, Knowle, and David John G. Bishop, Balsall Common, both of England, assignors to The Deritend Engineering Company Ltd., West Midlands, England

Filed Jan. 24, 1983, Ser. No. 460,531

Int. Cl.³ B26D *7/18*

U.S. Cl. 83—154 **3 Claims**



1. A rotary die-cutter comprising a cutting roll having cutting tools projecting from the surfaces of the roll for effecting complete separation of edge scrap from each of a succession of

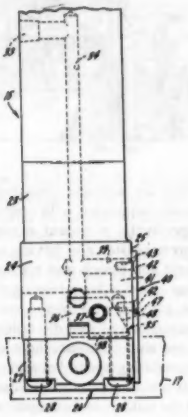
blanks, and a substantially cylindrical impression roll provided with means for clamping said scrap thereto and for taking the scrap arcuately about that roll, said means comprising a spacer plate secured to the surface of the impression roll with a thickness exceeding that of a blank, and a second plate mounted on the spacer plate and circumferentially movable thereon whilst carrying a plurality of spring fingers which can be extended beyond the edge of the first plate to trap said scrap.

4,501,181

METHOD FOR DELIVERING COOLANT TO A BAND SAW, AND STRUCTURE THEREFOR

John L. Yakich, Broadview, Ill., assignor to Armstrong-Blum Manufacturing Co., Chicago, Ill.

Filed Mar. 19, 1982, Ser. No. 360,011
Int. Cl.³ B23D *59/04*; B26D *7/08*
U.S. Cl. 83—169 **5 Claims**



1. In a coolant system for a metal cutting band saw having a guide arm located on the upstream side of the cutting span and in close proximity to the work piece being cut, said guide arm having within it a coolant passageway, the improvement comprising

a structure forming an egress opening at the end of the

an orifice means having an opening therein having sides to either side of the band saw blade, said sides being substantially parallel to each other,

said sides having a lower portion substantially conforming to said band saw blade, and having an upper portion extending substantially upwardly from the plane containing the band saw blade back surface so as to define a space through which the band saw blade does not pass, and

deflector means upstream from and near to said egress opening,

said deflector means having a surface element angularly displaced from both the horizontal and the vertical aligned with a perpendicular coolant flow passageway section,

said coolant flow passageway section directing coolant in a direction perpendicular to the direction of band saw blade movement,

said deflector means being disposed in the path of coolant flow so as to intercept a portion of said coolant as it travels in said perpendicular direction and redirect said coolant portion in a direction having a component of movement parallel to the direction of movement of the band saw blade,

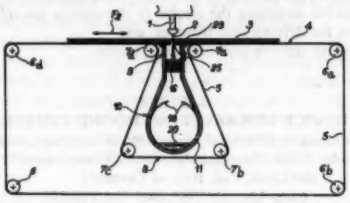
whereby at least some of said coolant portion will be in contact with said band saw blade over a long cutting span from the egress opening.

4,501,182

APPARATUS FOR CUTTING BY MEANS OF A HIGH PRESSURE FLUID JET

Alain Jardat, Courbevoie, and Joël André , Bougival, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Oct. 12, 1983, Ser. No. 541,137
Claims priority, application France, Oct. 19, 1982, 82 17473
Int. Cl.³ B26F *1/26*, *1/30*; D06H *7/00*
U.S. Cl. 83—177 **9 Claims**



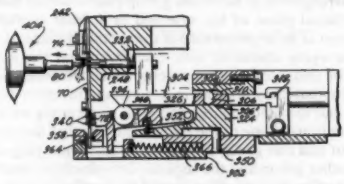
1. An apparatus for cutting by means of a high pressure fluid jet comprising a working nozzle supplying a fluid jet, a worktable able to support a material to be cut, means for displacing the working nozzle in a given cutting direction and a jet recovery system, wherein the worktable has a slot facing the working nozzle in the cutting direction, the jet recovery system being positioned behind said slot and having a chute at the bottom in which circulates a relatively cold liquid, an alveolar material placed at the inlet to the chute and set back relative to the worktable, and means for producing a vacuum at the inlet to the chute, between the worktable and the alveolar material.

4,501,183

LEADLESS CHIP PLACEMENT MACHINE FOR PRINTED CIRCUIT BOARDS

Weibley J. Dean, Binghamton; Charles E. Johnson, Whitney Point, and Phillip A. Ragard, Binghamton, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Division of Ser. No. 260,990, May 6, 1981, Pat. No. 4,458,412.
This application Apr. 25, 1984, Ser. No. 603,906
Int. Cl.³ B26D *5/26*
U.S. Cl. 83—233 **2 Claims**



1. An apparatus for indexed feeding of a component supply tape having feed holes spaced along the length thereof to position a component of said supply tape for pick-up at a pick-up station, and comprising:

a housing;

a cam bar reciprocatable within said housing, said cam bar having a key displaceable therein, and a cam surface;

a drive means for reciprocating said cam bar in a forward and reverse stroke, upon command;

a support block having a key hole for engagement by said key to provide keying of said block to said cam bar during a portion of said forward and reverse stroke such that said block is reciprocated;

an upwardly biased lever pivotally supported on said support block and having drive pins for engaging said feed

holes and indexing said tape during a portion of said forward stroke;

stop means for limiting the forward movement of said block during said forward stroke;

roller means attached to said lever and engageable by said cam surface during said forward stroke to cause downward pivoting of said lever for indexing of said tape;

dog means for holding said lever in the downward pivoted position during disengagement of said drive pins on said reverse stroke; and

sensor means for sensing said forward and reverse stroke.

4,501,184

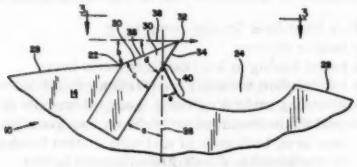
CUTTING TOOL WITH IMPROVED DEPTH CONTROL

Lewis A. Scott, Lake Oswego, and Duane M. Gibson, Milwaukie, both of Oreg., assignors to Omark Industries, Inc., Milwaukie, Oreg.

Filed Apr. 29, 1983, Ser. No. 489,860

Int. Cl.³ B27B *33/08, 33/12, 33/14*

U.S. Cl. 83—834 **8 Claims**



1. A cutting tool utilizing chip flow for controlling depth of cut for use in applications wherein a kerf is formed, comprising; a cutting tooth having a designated cutting direction, a cutting edge on said cutting tooth and outer relief and inner relief surfaces angled relative to the cutting direction rearwardly of the cutting edge which create a force during a cutting operation that urges increasing depth of cut, and a secondary surface intersecting the rearwardly angled inner relief surface at the desired depth of cut and extending forwardly from said intersection a distance at least equal to the length of the inner relief surface, the angles of the inner relief surface and the secondary surface being generally equal but oppositely directed relative to the cutting direction to thereby create a restrictive throat whereby chips cut by the cutting edge are impacted on the secondary suface for countering the force urging increasing depth of cut.

4,501,185

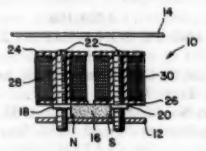
TRANSDUCER FOR STRINGER MUSICAL INSTRUMENT

Steven L. Blucher, New York, N.Y., assignor to Dimarzio Musical Instrument Pickups, Staten Island, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,684

Int. Cl.³ G10H *3/18*

U.S. Cl. 84—1.15 **3 Claims**



1. In a transducer for a stringed musical instrument whose output is to be electrically amplified, in which said transducer includes a pair of coils mounted adjacent each string of said instrument, the improvement in which said coils have individual axes and substantially the same number of turns of electrically conducting wire wound thereon, and the wires constituting said coils are of different gauges.

4,501,186

PICKUP DEVICE FOR STRINGED MUSICAL INSTRUMENT

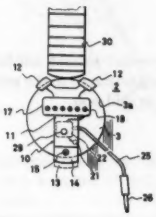
Masahiro Ikuma, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 15, 1983, Ser. No. 504,497

Claims priority, application Japan, Jun. 21, 1982, 57-92637[U]; Jun. 21, 1982, 57-92638[U]; Jul. 6, 1982, 57-102190[U]

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **7 Claims**



1. A pickup device in a stringed musical instrument having vibratory strings of magnetic material and a sound body carrying said strings and for transducing mechanical vibrations of said strings into electrical signals, said pickup device comprising:

a pickup mount member detachably attached to said sound body;

an electromagnetic pickup unit attached to said pickup mount member, said pickup mount member being attached to said sound body at a position whereby said electromagnetic pickup opposes said strings for electromagnetically transducing the vibrations of said strings into electrical signals;

a piezoelectric pickup unit detachably attached to said sound body at a position to receive the vibrations of said strings for piezoelectrically transducing said received vibrations of the strings into electrical signals; and

mixing amplifier means attached to said pickup mount member and electrically connected to said electromagnetic pickup unit and said piezoelectric pickup unit for mixing at a selectable ratio said electrical signals from both the electromagnetic and piezoelectric pickup units, thereby providing a mixed electrical output corresponding to the mechanical vibrations of said strings, said mixing amplifier means including a single adjustment means for continuously varying the relative amplitudes of the electrical signals from said electromagnetic pickup and said piezoelectric pickup in opposite directions simultaneously.

4,501,187

VERTICAL LAUNCH ALIGNMENT TRANSFER APPARATUS

Harold V. White, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1983, Ser. No. 470,749

Int. Cl.³ F41G *3/02*

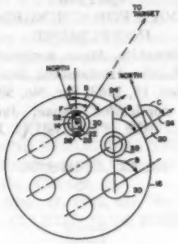
U.S. Cl. 89—1.8 **3 Claims**

1. A vertical launch alignment transfer apparatus comprising:

a. a vehicle having a launch pod thereon, said launch pod provided with a plurality of launch tubes having missiles therein;

b. a northfinder carried on said pod; and,

c. mechanical interface means including a first means attached to the missile and oriented to the guidance system of said missile and a second means attached to said launch



tube and oriented to said northfinder whereby azimuth alignment is transferred to the guidance system of individual missiles in said pod.

4,501,188

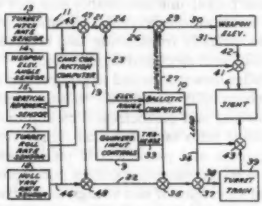
REMOTE CONTROL SYSTEM

Arthur J. Wroble, Grosse Pointe Shores, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 22, 1982, Ser. No. 436,170

Int. Cl.³ F41G *5/16, 1/00*

U.S. Cl. 89—41 M **2 Claims**



1. A control system for establishing a line of fire for a weapon mounted on a vehicle subject to rotational movements about axes oblique to the line of fire of the weapon and for stabilizing the weapon, the system including sighting means operable to define the direction of the line of sight to a target as signals of train and elevation of the sight relative to the vehicle,

stabilizing means operative to generate signals counteracting the effect of said rotational movements, means for applying the stabilizing signals to the signals established by the sighting means to provide weapon train and elevation signals for control of the line of fire of the weapon, and a transmission system for each of the weapon train and elevation signals each transmission system including a pulse generating means effective to generate pulses at a frequency proportional to the rate of change of the signal and a stepping motor drivingly coupled to the weapon and driver by the said pulses.

4,501,189

SILENCED HAND-HELD FIREARM WITH ROTATING TUBE AND SLEEVE

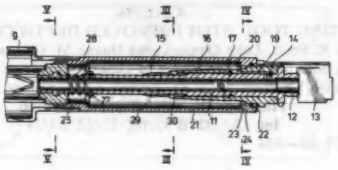
Rudolf Brandl, Dornhan, and Herbert Doll, Oberndorf, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,267

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131265

Int. Cl.³ F41F *17/12*

U.S. Cl. 89—14.4 **6 Claims**



1. A hand-held firearm comprising:

a muzzle silencer;

a barrel having at least one transverse bore;

a tube section mounted for rotation on said barrel and surrounding said barrel being spaced therefrom at least over part of the length of said tube section to define an expansion area, both ends of said tube section being connected to the barrel in a sealed relationship thereto;

a path connecting said transverse bore and said expansion area;

means for selectively blocking said path, including a sleeve surrounding the barrel and mounted for rotation thereon, said sleeve having a first position in which said path is open and a second position in which said path is closed;

a positive coupling connecting said tube section to the sleeve for rotation therewith, said coupling being disengageable upon forward axial displacement of said tube section and sleeve relative to said barrel;

a connecting member closing an end of the tube section adjacent to the muzzle of the barrel;

means connecting said connecting member and tube section with the barrel and having a first rotational position corresponding to the first position of said sleeve in which said tube section is locked to the barrel and a second rotational position corresponding to the second position of said sleeve in which said tube section can be removed from the barrel upon forward axial movement relative thereto,

whereby when the tube section is in rotational position to be disconnected from the barrel by forward axial movement, the sleeve is in position closing the path from the transverse bore to the expansion area, and when the tube section is in rotational position locked to the barrel, the sleeve is in position opening the path from the transverse bore to the expansion area.

4,501,190

RACK AND PINION WEAPON ELEVATION MECHANISM

James C. Hobson, St. Clair Shores, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

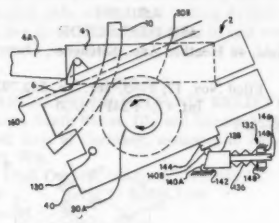
Division of Ser. No. 423,583, Sep. 27, 1982, Pat. No. 4,441,401. This application Jan. 30, 1984, Ser. No. 574,832

Int. Cl.³ F41G *5/04*

U.S. Cl. 89—41 H **7 Claims**

1. A combat vehicle having a turret means, a weapon mounted on the turret means for pivotable motion about a first axis and having driven gear means, a rack and pinion mechanism including an output pinion means in driving engagement with said driven gear for elevating or depressing said weapon and a supporting housing means for said mechanism mounted to said turret means for pivotable motion about a second axis,

and further having biasing means including wedging means disposed between portions of said turret means and said housing means and means for biasing said wedging means in a direction to operatively engage said portions of said housing



means and turret means to pivot said housing means relative to said turret means about said second axis such that said output pinion means is biased against said driven gear to reduce backlash.

4,501,191

POWER ASSISTED STEERING GEAR

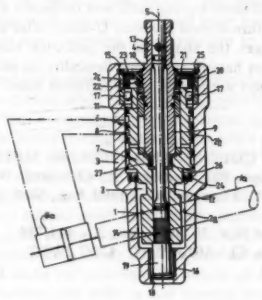
Gordon E. G. Webber, and Alan G. Wilson, both of Bristol, England, assignors to Cam Gears Limited, Hertfordshire, England

Filed May 23, 1983, Ser. No. 496,943

Claims priority, application United Kingdom, Jun. 18, 1982, 8217632

Int. Cl.³ F15B *13/16*

U.S. Cl. 91—375 A **22 Claims**



1. A power assisted steering gear comprising a housing defining a chamber and having an opening therein at one side thereof, an input shaft extending into said chamber through said opening, a toothed part rotatably mounted in said chamber for driving an output member in response to rotation of said input shaft, said input shaft and said toothed part being capable of restricted rotation relative to each other, valve means located in said chamber and responsive to relative rotation of said input shaft and toothed part for controlling fluid flow to a servo motor associated with said output member to provide power assistance to movement thereof, means attaching said valve means and said toothed part and said input shaft to form in a single unitary assembly for insertion into said chamber through said opening as a unitary assembly and for removal from said chamber through said opening as a unitary assembly, a single retaining means for retaining said unitary assembly in said chamber and preventing removal thereof from said chamber through said opening, said single retaining means being located at said one side and comprising a releasable means releasable to allow for removal of said unitary assembly through said opening.

4,501,192

PISTON FOR PRECISION DOSING INSTRUMENT

Erich Knödel, Wertheim, Fed. Rep. of Germany, assignor to Walter Graf u. Co GmbH & Co., Wertheim, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,132

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138536

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ B23P *15/10*; F16J *1/02*

U.S. Cl. 92—248 **9 Claims**

1. A piston for a precision dosing instrument comprising:

a cylindrical core and a sleeve of polytetrafluorethylene disposed on said core,

said core being of glass, ceramic or metal and being formed as a rigid tube open at both longitudinal ends, said longitudinal end adjacent the working end of the piston is defined by a substantial planar surface extending perpendicularly of the longitudinal axis of the core with at least one relatively small opening therein forming a part of the opening of said tube,

said sleeve being one integral piece with a cylindrical first portion extending about the cylindrical walls of said core and having a cylindrical outer surface and a closed end second portion extending over and engaging the longitudinal end of said core adjacent the working end of the piston, said closed end second portion having a greater thickness than said first portion and a planar front working face extending perpendicularly of the longitudinal axis of said core,

said sleeve being thermally shrunk onto said core and precision-ground finished.

4,501,193

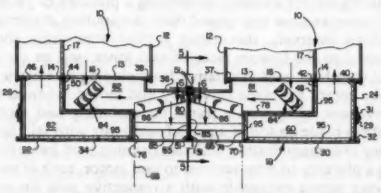
MOUNTING CURB FOR MULTIPLE UNIT AIR CONDITIONING SYSTEM

Spiridon Trigourea, Palatin Township, Cook County, Ill., assignor to Snyder General Corporation, Dallas, Tex.

Filed Nov. 29, 1982, Ser. No. 445,149

Int. Cl.³ F24F *5/00*

U.S. Cl. 98—33.1 **18 Claims**



1. A mounting curb for supporting at least two self contained air conditioning units adapted for roof top installation, said air conditioning units each including an enclosure having a bottom wall including a first opening for receiving return air from a building return air duct and a second opening for discharging conditioned air to a building supply air duct, said mounting curb being characterized by:

a rectangular perimeter frame including spaced apart longitudinal sidewalls and opposed end walls;

means on said frame for supporting each of said enclosures spaced apart on said frame;

spaced apart generally horizontal top wall means and bottom wall means of said frame joined to said side walls and said end walls, respectively;

a set of spaced apart first openings in said top wall means adapted to be aligned with respective ones of said first openings in said enclosures;

a set of spaced apart second openings in said top wall means adapted to be aligned with respective ones of said second openings in said enclosures;

first and second openings formed in said bottom wall means adjacent to each other generally centrally disposed between said end walls and in communication with said building air ducts, respectively;

a first set of opposed ducts formed in said curb for conducting air between said first openings in said top wall means and said first opening in said bottom wall means, respectively;

a second set of opposed ducts formed in said curb for conducting air between said second openings in said top wall means and said second opening in said bottom wall means, respectively; and

respective horizontal wall means and vertical wall means in said curb each forming common walls separating each of said first ducts from each of said second ducts for directing air between said enclosures and said building air ducts within said frame.

4,501,194

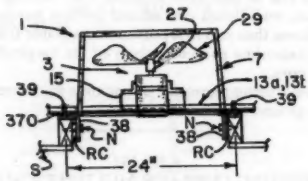
WHOLE HOUSE ATTIC FAN

William J. Brown, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 23, 1983, Ser. No. 507,041

Int. Cl.³ F24F *7/06*

U.S. Cl. 98—42.07 **12 Claims**



1. In a ventilating fan installable in the ceiling of a building for drawing air from outside the building through the interior of the building, for forcing air into the attic space of the building, and for exhausting air from within the attic space of the building to the out of doors via attic vents or the like, the building having a ceiling comprising a plurality of joists parallel to one another and spaced from one another at substantially uniform intervals, the ceiling further comprising sheathing secured to the bottom faces of said joists, and an opening in said sheathing, said ventilating fan including an electric motor and a rotary fan blade driven by said motor, wherein the improvement comprises: a frame for mounting said motor and said fan blade on top of a pair of said joists with said fan blade being in communication with said opening, said frame comprising a plurality of arms secured to said motor, each of said arms having means engagable with a respective joist for securely mounting said frame to said joists, a generally truncated conical venturi surrounding said fan blade, said venturi being of somewhat larger cross section than the diameter of said fan blade and being of a height similar to or greater than said motor and fan blade, a plenum box having a top cover and sides depending downwardly therefrom for providing at least part of an air flow path between said opening in said ceiling and said venturi, said plenum box having an opening in its top cover for registration with said venturi, and means for securing said venturi to said plenum box from the inside of and from below the plenum box and the venturi.

4,501,195

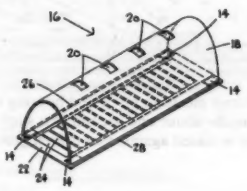
AIR DEFLECTOR

Peter J. Held, 46 Heather Ave., Kitchener, Ontario N2B 1M1, Canada

Filed Nov. 17, 1983, Ser. No. 552,792

Int. Cl.³ F24F *13/06*

U.S. Cl. 98—103 **6 Claims**



1. An air deflector for use with an air register through which air is passed, said register having two parallel sides, said deflector comprising a rectangular sheet of flexible and resilient material having two opposing edges that are folded in the same direction so that a flange is formed along each of said opposing edges, said sheet having sufficient rigidity so that said flanges remain in position after the sheet is folded, the deflector having an inverted U-shaped cross-section when mounted on said register with one of said flanges placed along each of said parallel sides of said register, with means to hold said flanges on said sides, said sheet having sufficient resiliency so that said deflector will return to said inverted U-shape after an external force that changes the shape of the deflector has been removed, said sheet having sufficient flexibility so that one deflector can be used with registers of different sizes.

4,501,196

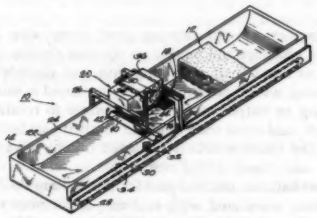
PROCESS VAT CUTTING AND STIRRING MECHANISM

Fred A. Loichinger, 807 Westview St., Cleveland, Wis. 53015, and Meredith C. Thomson, 806 Grand Ave., Sheboygan, Wis. 53081

Filed Nov. 15, 1982, Ser. No. 441,759

Int. Cl.³ A01J *25/00;* **A23C** *19/00*

U.S. Cl. 99—461 **16 Claims**



1. An apparatus for processing a mixture to produce a product such as cottage cheese, said apparatus comprising

a holding tank for holding the product and including opposite ends,

a cutting device for cutting the product,

a support structure for supporting said cutting device above said holding tank, so that said cutting device can extend into the product,

moving machinery for moving said cutting device horizon-

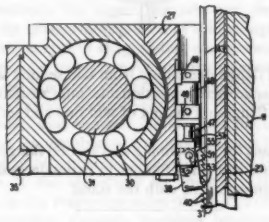
tally along said holding tank so that said cutting device can cut the product in one direction, and

means for causing reciprocative movement at regular intervals of said cutting device perpendicular to said one direction as said cutting device moves along said holding tank between said ends, so that said cutting device can cut the product in a direction perpendicular to said one direction.

4,501,197
SUPERCALENDER EDGE NIP RELIEVING

Gerald W. Karr, South Beloit, Ill., and Gernot Müller, Kusterdingen, Fed. Rep. of Germany, assignors to Beloit Corporation, Beloit, Wis.

Filed Oct. 19, 1983, Ser. No. 543,167
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—35 **19 Claims**



1. A method of operating a calender having a vertical stack of a plurality of rotary rolls, each of said rolls having a bearing structure at each opposite end, means for guiding said bearing structures for vertical movement, and means for vertically shifting said rolls between a spaced apart independent suspension mode and a nipping mode relation to one another, and comprising:

relieving the weight of said bearing structures of said rolls in said nipping mode relation of said rolls by operating lifting pawls in cooperation with associated racks.

11. A calender having a vertical stack of a plurality of rotary rolls, each of said rolls having a bearing structure at each opposite end, means for guiding said bearing structures for vertical movement, and means for vertically shifting said rolls between a spaced apart independent suspension mode and a nipping mode relation to one another, and comprising:

means including lifting pawls which cooperate with associated racks for relieving the weight of said bearing structures from said rolls in said nipping mode relation;

and means for operating said relieving means.

4,501,198
DEVICE FOR COMPRESSING IN PARTICULAR ALUMINUM CANS

Sune H. Johansson, and John K. C. Gustavsson, both of Sävsjö, Sweden, assignors to Magnus Wilhelm AB, Sävsjö, Sweden

Filed Mar. 16, 1983, Ser. No. 475,866
Claims priority, application Sweden, Mar. 25, 1982, 8201897
Int. Cl.³ B30B *9/32*
U.S. Cl. 100—98 R **10 Claims**

1. A device for compressing in particular aluminum cans, comprising

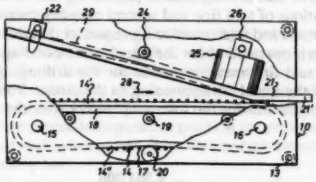
a frame,

an endless driven belt supported in the frame to provide a belt run, and

a hold-down member extending along and located opposite said belt run to define inlet and discharge ends of the belt run, wherein said belt run and said hold-down member are spaced from each other at said inlet end at a distance which exceeds the maximum diameter of the can to be compressed, and progressively approach each other to a position in which they are located close to each other at said discharge end,

the hold-down member being resiliently yieldable in a direction away from the belt, at least throughout its proximal portion with respect to said discharge end,

the endless belt having friction increasing means on a side facing said hold-down member, and the surface of the



hold-down member which faces the belt being smooth and of low friction,

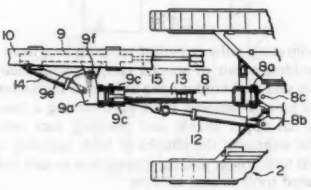
the hold-down member being fixed at said inlet end, and being supported against the pressure of said compressing of said cans by spring means in the vicinity of said discharge end, and

said hold-down member including a plate of elastic plastic material of low friction facing said belt run.

4,501,199
AUTOMATICALLY CONTROLLED ROCK DRILLING APPARATUS

Tohru Mashimo; Takashi Nishio, and Osamu Satoh, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 10, 1983, Ser. No. 465,652
Claims priority, application Japan, Feb. 12, 1982, 57-21871
Int. Cl.³ F42D *3/00*
U.S. Cl. 102—313 **8 Claims**



1. A rock drilling apparatus comprising boom means, drilling means adapted to be mounted on said boom means, follow-up work performing means adapted to be mounted on said boom means in lieu of said drilling means for performing a follow-up work after drilling operation, first actuator means for moving said boom means so that said means mounted on the boom means is located against a desired position on a rock surface in a desired direction, second actuator means for advancing and retreating said means mounted on the boom means to perform drilling operations and the follow-up works, detecting means for detecting actual position and direction of said drilling means in a drilled bore upon completion of a drilling operation, first memory means memorizing values of rectangular coordinates of positions on the rock surface where bores are to be drilled, transducing means for converting the values in the rectangular coordinates memorized in the first memory means into values corresponding to positions of said boom means, second memory means memorizing values corresponding to the actual positions and directions of said drilling means in respective ones of the drilled bores upon completion of respective drilling operations, servo control means for operating said first actuator means, selecting means for selecting one

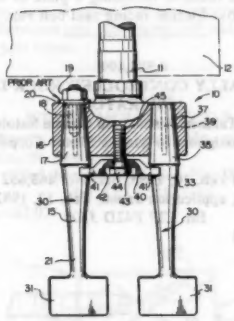
of the signals corresponding to outputs from said first and second memory means so that said servo control means is applied with a signal corresponding to said one signal to operate said first actuator means in accordance with said one signal, feedback means for feeding back values of movements of said boom means to said servo control means, drill control means operable under an output from said servo control means for operating said second actuator means to thereby control movements of said drilling means, processing means for controlling operations of said first and second memory means, said selecting means and said transducing means so that the servo control means is operated under the signal corresponding to the output from said first memory means for the drilling operations and under the signal corresponding to the output from said second memory means for the follow-up works after the drilling operation.

4,501,200

TAMPING TOOL RETAINER

Anthony Delucia, West Columbia, S.C., assignor to Canron Corp., West Columbia, S.C.

Filed Dec. 17, 1982, Ser. No. 450,512
Int. Cl.³ E01B *27/16*; A01B *35/22, 1/22*; E01C *19/30*
U.S. Cl. 104—10 **7 Claims**



1. A vibrating railway ballast tamping tool head comprising a tool holder; a pair of spaced tamping tool-shank receiving sockets in said tool holder open at least to the underside of said holder; a pair of tamping tools each having a lower working face and an upper shank; and tamping tool retaining yoke means for engaging the shanks of both tamping tools underneath said tool holder and for connection to said holder to lock said located tools in said sockets.

4,501,201

REMOVABLE TRAY FOR MICROPHONE STANDS

Marcel Fitzner, 1672 Cerro Gordo, and Vesta P. Pinnell, Jr., P.O. Box 2894, both of Santa Fe, N. Mex. 87501

Continuation-in-part of Ser. No. 273,395, Jun. 15, 1981, Pat. No. 4,383,487. This application Apr. 21, 1982, Ser. No. 370,180
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.³ A47B *85/00*
U.S. Cl. 108—27 **8 Claims**

1. A detachably attached tray for stands supporting a microphone and cord depending therefrom, said tray comprising in combination:

(a) a first section for defining a part of said tray and including a first edge;

(b) a second section for defining the remaining part of said tray and including a second edge;

(c) pivot means for pivotally attaching said first section to said second section;

(d) mounting means disposed within said first and second edges for encircling the stand on pivoting of said first and second sections toward one another to mate said first and second edges;

(e) indentation means disposed within said first and second edges for encircling the cord on pivoting of said first and second sections toward one another to mate said first and second edges;

(f) a first and third flange depending from said first section;

(g) a second flange depending from said second section, said second flange being positionable intermediate said first and third flanges on mating of said first and second edges; and

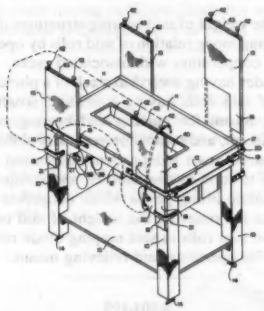
(h) latch means for maintaining said second flange intermediate said first and third flanges to maintain said mounting means in engagement with the stand.

4,501,202

BODY SHOP WORKTABLE

Herman Corazza, 1330 Kimberly Ave., Rock Springs, Wyo. 82901

Filed Oct. 27, 1982, Ser. No. 437,040
Int. Cl.³ B25H *1/10*
U.S. Cl. 108—50 **10 Claims**



1. A worktable for use in repairing automobile bodies, said table comprising:

a substantially rectangular, substantially horizontally disposed, top surface, with four legs extending downwardly from the four corners of the table to support the top surface;

at least a pair of substantially planar sideboard members comprising substantially rectangular, broad, board-like members which are adapted to extend longitudinally upwardly from the top surface of said table, with each sideboard member further having an extension projecting from the bottom of the rectangular sideboard member, said extension being a substantially flat, elongate section whose width is less than the corresponding width of the rectangular sideboard member: and

means for releasably securing the planar sideboard members to the table comprising four pair of band-like attachment members, one pair of attachment members being located

at each of the respective corners of the worktable, each pair of attachment members including an upper bracket and a lower bracket, with the upper brackets being attached to a mutually respective side of the table adjacent to the top surface and with the lower brackets being attached to a mutually corresponding leg of the table and being spaced from the upper brackets a distance less than the longitudinal length of the flat elongate extensions which project from the bottom sides of the rectangular sideboard members, said upper brackets comprising elongate, rigid bands which are spaced from respective sides of the table, said elongate rigid bands having inwardly projecting leg members at the opposite ends thereof, with means being provided for attaching the inwardly projecting leg members at the opposite ends thereof, with means being provided for attaching the inwardly projecting ends of the respective leg members of said upper brackets to the respective sides of said table to form respective, elongate spaces between the upper brackets and the respective sides of the table, wherein each of said elongate spaces is adapted to receive in snug, sliding engagement therewith the bottom of a respective rectangular sideboard member, said lower brackets comprising elongate, rigid straps which are spaced, respectively, from the sides of the legs of the table, said elongate, rigid strips having inwardly projecting leg members at the opposite ends thereof, with means being provided for attaching the inwardly projecting ends of the respective leg members of said lower brackets to the respective sides of the legs of the table to form respective elongate openings between the lower brackets and the respective sides of the legs of the table, wherein each of said elongate openings is adapted to receive in snug, sliding engagement therewith the free end portion of a flat, elongate extension of a respective planar sideboard member.

4,501,203

SAFETY MECHANISM FOR PREVENTING THE LOCKING UP OF PERSONS IN CABINETS

Arne Lyngstrup, Herlev, Denmark, assignor to A/S Sparevirke, Copenhagen, Denmark

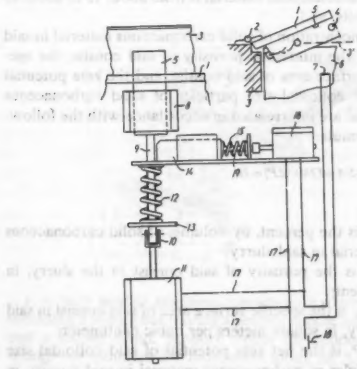
PCT No. PCT/DK82/00059, § 371 Date Feb. 17, 1983, § 102(e) Date Feb. 17, 1983, PCT Pub. No. WO83/00180, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 29, 1982, Ser. No. 468,057

Claims priority, application Denmark, Jun. 30, 1981, 2908/81

Int. Cl.³ E05G *1/04*

U.S. Cl. 109—635 **1 Claim**



1. A strong room structure including a frame member providing an entrance opening, a door member mounted in said frame member, and a mechanism for preventing unauthorized closing of said door when at least one person is present on the floor of said room, said mechanism comprising

a primary bolt carried by one of said frame and door members and displaceable between a retracted inoperative position and a protruded operative position whereby in said operative position said primary bolt prevents closing of said door by abutment against the other one of said frame and door members,

first spring means normally urging said primary bolt toward said operative position,

a first electromagnet having sufficient strength when energized to retain said primary bolt in said inoperative position against the action of said first spring means,

an auxiliary bolt carried by said one of said frame and door members and displaceable between a retracted inoperative position and a protruded operative position for preventing retraction of said primary bolt from the operative position of said primary bolt,

second spring means normally urging said auxiliary bolt towards its operative position,

a second electromagnet having sufficient strength when energized to retain said auxiliary bolt in said inoperative position against the action of said second spring means,

an electric circuit for actuating said first and second electromagnets and including a normally closed first switch adapted to be automatically opened by the weight of a person entering said room and a second independently operable switch for actuating said first and second electromagnets.

4,501,204

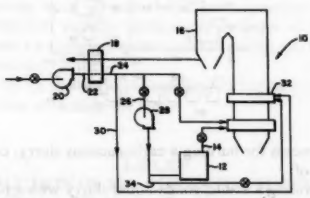
OVERFIRE AIR ADMISSION WITH VARYING MOMENTUM AIR STREAMS

Michael S. McCartney, Bloomfield, and William H. Pollock, East Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 21, 1984, Ser. No. 612,114

Int. Cl.³ F23D *1/02*

U.S. Cl. 110—264 **2 Claims**



1. In combination, a vertical furnace of substantially square cross section, in which pulverized coal is burned, a rear pass connected to the upper portion of the furnace through which the combustion gases are exhausted from the furnace, a heat exchanger in which the combustion gases give up heat to combustion air passing therethrough, a first duct through which air is supplied to the heat exchanger, a first fan in the first duct for supplying low pressure air to the heat exchanger, first nozzle means located in each of the four corners of the furnace, for introducing coal into the furnace tangentially of an imaginary circle located in the center of the furnace, so that a fireball is created which flows upwardly therein along a first rotational path, a second duct for conveying low pressure air from the heat exchanger to the first nozzle means, a pulverizer mill in which coal is pulverized, a third duct having an inlet connected to the second duct, and an outlet connected to the pulverizer mill, second fan means positioned in the third duct, for supplying high pressure air to the pulverizer mill, a fourth duct for supplying pulverized coal carried in a high pressure air stream from the pulverizer mill to the first nozzle means, second nozzle means located in each of the four corners of the furnace above the level of the first nozzle means, for introduc-

ing overfire air to the furnace tangentially of an imaginary circle therein, in a direction of rotation opposite to that of the fireball, so that the gases flowing to the rear pass have little or no rotational flow, a fifth duct for conveying low pressure air from the second duct to the second nozzle means, and a sixth duct for conveying high pressure air from the third duct at a point downstream of the second fan to the second nozzle means.

4,501,205

PROCESS FOR BURNING A CARBONACEOUS SLURRY

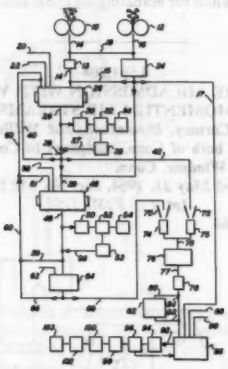
James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 375,183, May 5, 1982, Pat. No. 4,441,887, which is a continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, Pat. No. 4,416,666, which is a continuation-in-part of Ser. No. 088,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Mar. 10, 1983, Ser. No. 474,125

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.[3] **F23D** *1/00*

U.S. Cl. 110—347 **50 Claims**



1. A process for burning a carbonaceous slurry, comprising the steps of:

(a) providing a stable, solids-liquid slurry with a pH of from about 5 to about 12 comprising a consist of finely-divided particles of solid carbonaceous material dispersed in said liquid, wherein:

1. said slurry is comprised of at least about 60 volume percent of said solid carbonaceous material (dry basis), less than about 40 volume percent of said liquid, and from about 0.01 to about 4.0 weight percent (based on weight of dry solid carbonaceous material) of dispersing agent;
2. said slurry has a yield stress of from about 3 to about 18 Pascals and a Brookfield viscosity at a solids content of 70 volume percent, ambient temperature, ambient pressure, and a shear rate of 100 revolutions per minute of less than 5,000 centipoise;
3. said consist has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than 20 volume percent;
4. from about 5 to about 70 volume percent of said particles of solid carbonaceous material are of colloidal size, being smaller than about 3 microns;
5. said consist of finely-divided particles of solid carbonaceous material has a particle size distribution substantially in accordance with the following formula:

$$\frac{CPFT}{100} = \sum_{j=1}^{k}\left[X_j\left(\frac{D^{Nj}-D_{sj}{}^{Nj}}{D_{Lj}{}^{Nj}-D_{sj}{}^{Nj}}\right)\right]$$

where $\sum_{j=1}^{k} X_j = 1.0$

and where if $D < D_{sj}$ $\left(\frac{D^{Nj}-D_{sj}{}^{Nj}}{D_{Lj}{}^{Nj}-D_{sj}{}^{Nj}}\right) = 0.0$

and where if $D > D_{Lj}$ $\left(\frac{D^{Nj}-D_{sj}{}^{Nj}}{D_{Lj}{}^{Nj}-D_{sj}{}^{Nj}}\right) = 1.0$

wherein

(a) CPFT is the cumulative percent of said solid carbonaceous material finer than a certain specified particle size D, in volume percent;

(b) k is the number of component distributions in the consist and is at least 1;

(c) X_j is the fractional amount of the component j in the consist, is less than or equal to 1.0, and the sum of all of the X_j's in the consist is 1.0;

(d) N is the distribution modulus of fraction j and is greater than about 0.001;

(e) D is the diameter of any particle in the consist and ranges from about 0.05 to about 1180 microns;

(f) D_s is the diameter of the particle in fraction j, measured at 1% CPFT on a plot of CPFT versus size D, is less than D_L, and is greater than 0.05 microns;

(g) D_L is the diameter of the size modulus in fraction j, measured by sieve size or its equivalent, and is from about 10 to about 1180 microns; and

(h) no more than about 0.05 volume percent of the particles in the slurry consist have a diameter less than about 0.05 microns;

6. the net zeta potential of said colloidal size particles of solid carbonaceous material is from about 15 to about 85 millivolts; and

7. the concentration of solid carbonaceous material in said slurry, the interstitial porosity of said consist, the specific surface area of said consist, and the zeta potential of said colloidal size particles of solid carbonaceous material are interrelated in accordance with the following formula:

$$V_s + P_s + S.A + (240/Z.P) = H$$

wherein:

(a) V_s is the percent, by volume, of solid carbonaceous material in said slurry;

(b) P_s is the porosity of said consist in the slurry, in percent;

(c) S.A. is the specific surface area of said consist in said slurry, in square meters per cubic centimeter;

(d) Z.P. is the net zeta potential of said colloidal size particles of carbonaceous material in said consist, in millivolts, and

(e) H is from about 75 to about 98.

(b) atomizing said slurry; and

(c) burning said atomized slurry.

4,501,206

METHOD OF IGNITING A PULVERIZED-COAL PILOT-BURNER FLAME

Klaus Leikert, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 358,540, Mar. 16, 1982, abandoned. This application Mar. 16, 1984, Ser. No. 590,207

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110272

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 5 Claims

1. A method of igniting a pulverized-coal pilot-burner flame for a pulverized-coal annular burner flame having an internal back flow region, with the ignition energy for said annular burner flame being introduced centrally into the interior of the back flow region of the annular burner flame for the purpose of saving highgrade fuel, such as oil or gas, otherwise used for the ignition process taking into account functional interrelationships as to ignition quality of fuels, said method comprising in combination the steps of:

carrying out an initial ignition of said pulverized-coal pilot-burner, said initial ignition being advantageously produced in every operating condition, for instance with cold as well as hot steam generators under conditions which permit a minimizing of the initial ignition energy for the igniter of the pulverized-coal pilot-burner flame;

effecting optimum quality reliable and stable ignition of said pulverized-coal pilot-burner flame during the process of said initial ignition, at constant primary and secondary air flow and a fixed air coefficient λ of 1.1 to 0.4, by a step of supplying to said pilot-burner at least once a coal powder-laden air/coal powder mixture at a powder-laden air/-powder weight ratio of 1.0 to 0.2; and

after said ignition has been effected, continuously adding a specified coal flow to said pilot-burner flame at said fixed air coefficient λ of 1.1 to 0.4 such that different fuel characteristics are equalized and compensated without negatively influencing the ignition process while assuring that functional interrelationships cover the range from the least to the optimum ignition quality of fuels.

4,501,207

HOLE SEWING MACHINE

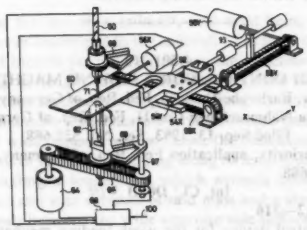
Hiroshi Miyazaki, and Masahisa Kato, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 26, 1983, Ser. No. 461,305

Claims priority, application Japan, Jan. 26, 1982, 57-9003[U]

Int. Cl.³ D05B *3/00*

U.S. Cl. 112—66 12 Claims



1. A hole sewing machine comprising a sewing mechanism including a needle bar having a sewing needle coupled thereto, and a looper stand, support means for supporting a fabric workpiece mounted for movement along an X-axis and a Y-axis orthogonal to each other, an X-axis direction feed motor for moving said support means in the direction of said X-axis, a Y-axis direction feed motor for moving said support means in the direction of said Y-axis, rotating means for sychonronously rotating said needle bar and said looper stand and control means for supplying driving signals to said rotating means according to a predetermined hole sewing program.

4,501,208

PROCESS FOR THE BIDIRECTIONAL FEEDING OF FABRICS IN QUILTING MACHINES, AND A MACHINE UTILIZING THIS PROCESS

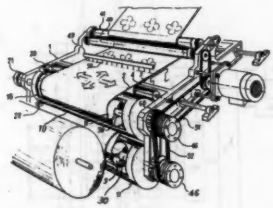
Giannino Landoni, Fagnano Olona, Italy, assignor to Meca S.a.s. di Cagnoni Landoni S.C., Cassano Magnago, Italy

Filed Sep. 8, 1983, Ser. No. 530,314

Claims priority, application Italy, Sep. 16, 1982, 23299 A/82; Sep. 16, 1982, 23300 A/82

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—118 8 Claims



1. A process for the bidirectional feeding of fabrics in a quilting machine for the application of stitches to a product comprising at least one web of fabric which is unwound from a roll, which comprises the following phases:

(a) Unwinding a web of fabric (2,3; 102,103) from at least one roll (8,9; 108,109) during the phase of forward movement and applying a first series of stitches to the fabric during this forward movement;

(b) Stopping the movement of the roll (8,9; 108,109) and locking the roll in position;

(c) Moving back at least one time a portion of fabric (2,3;102,103) already stitched on in order to form the product by applying further stitches during this backward movement;

(d) Resuming the normal unwinding of the fabric from the roll after unlocking the latter.

4,501,209

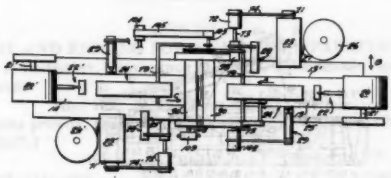
CONSTRUCTION OF FLY PIECES FOR MEN'S BRIEFS

J. Herbert Keeton, 727 Meader Dr., Campbellsville, Ky. 42718

Filed Sep. 28, 1982, Ser. No. 426,144

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 30 Claims



1. Apparatus for constructing fly pieces of men's briefs or the like, comprising:

means for simultaneously and synchronously forming two sheets of fly pieces, each having alternating band-stitched arcuate side portions and non-band-stitched straight portions along a first edge thereof;

means for combining said sheets together in face-to-face

relationship with the first side of one sheet opposite the first side of the other sheet;

means for partially severing the sheets when in face-to-face relationship, into distinct fly pieces; and

means for coiling the partially severed sheet into a roll of a plurality of pairs of fly pieces.

4,501,210

ELECTRODE CONTROL SEWING MACHINE

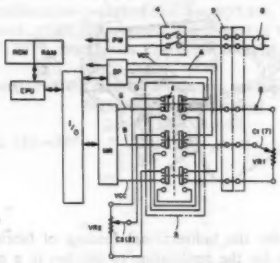
Susumu Hanyu, and Kenji Kato, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 188,599, Sep. 19, 1980, abandoned. This application Oct. 22, 1981, Ser. No. 313,986

Claims priority, application Japan, Sep. 27, 1979, 54-123134

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 E **4 Claims**



1. An improvement to a micro-computer controlled sewing machine having a dial manually operated to adjust a needle swinging amplitude and a machine controller adjustably operated to control the rotation speed of the sewing machine, the improvement comprising: a conversion switch connected to the dial and to the machine controller and having a first position and a second position; and means connected to the conversion switch and to the micro-computer and operating in a manner that when the conversion switch is in the first position, the machine controller will control the rotation speed of the sewing machine and when the conversion switch is in the second position, the machine controller will control the needle swinging amplitude.

4,501,211

LOCK STITCH TYPE HAND SEWING MACHINE

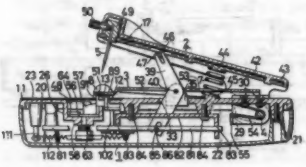
Tuneo Seyama, Yono, Japan, assignor to Kabushiki Kaisha Niida Seisakusho, Sanjo, Japan

Filed Sep. 30, 1982, Ser. No. 431,571

Claims priority, application Japan, Dec. 8, 1981, 56-196254

Int. Cl.³ D05B *97/02, 57/12, 75/04*

U.S. Cl. 112—169 **8 Claims**



1. A lock stitch hand sewing machine comprising a bed, a needle arm pivoted at one end of said bed and manually movable toward said bed from an open position at an acute angle to said bed to a closed position, spring means biasing said needle arm toward open position, a needle plate on said bed having a needle opening therein, a needle carried by said needle arm and movable through said opening in said needle plate when said needle arm is moved from open to closed position, means for supplying an upper thread to said needle, a bobbin on said bed below said needle plate for supplying a lower thread, a shuttle carrying said bobbin, driving means for moving said shuttle to interlock said lower thread with said upper thread when said needle is moved through said opening in the needle plate, and transmitting means for activating said driving means, including a rocking lever pivoted at an intermediate point to said bed and having one end connected with said needle arm and the other end extending within said bed, a rack reciprocable in said bed and connected with said other end of said lever so as to be reciprocated thereby and a pinion engaged with said rack and fixed on said driving means, whereby rocking motion of said needle arm by manual operation is transmitted to said driving means to move said shuttle to interlock said lower thread with said upper thread.

4,501,212

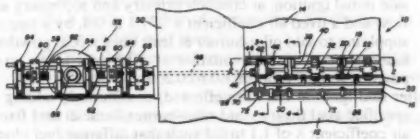
TUFTING MACHINES

Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Nov. 14, 1983, Ser. No. 550,935

Int. Cl.³ DO5C *15/00*

U.S. Cl. 112—266.2 **20 Claims**



1. A method of tufting pile fabric comprising, feeding a backing material in one direction, reciprocably penetrating a plurality of needles through said backing material from one side thereof, said needles being spaced apart transversely to said feed direction, supporting said material during needle penetration thereof by a plurality of fingers spaced apart in the same direction as said needles, the spacing between adjacent fingers being substantially the same as the spacing between adjacent needles, shifting said needles and said fingers in synchronism from a first position transversely to said one direction while said needles are on one side of said material, penetrating said material with said needles, and shifting said needles and said fingers in synchronism to said first position while said needles are within the backing material.

4,501,213

FEED CONTROL FOR A SEWING MACHINE

Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,688

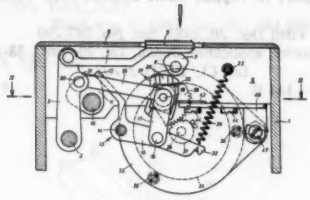
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234688

Int. Cl.³ D05B *3/04*

U.S. Cl. 112—316 **7 Claims**

1. A control device for the work feeding mechanism of a sewing machine having a support carrying an oscillating mechanism for shifting a feed dog backwardly and forwardly in an amount controlled by a sliding member which is movable in a guideway and depending on the position of the guideway and the sliding member relative to each other, comprising a stepping motor support having a drive shaft supporting bushing, a rotatable setting shaft rotatably supported in said bushing, a stepping motor mounted on said stepping motor support and having a rotatable drive shaft drivingly connected to said

setting shaft to rotate said setting shaft a selected amount, said setting shaft being connected to one of said sliding member and



said guide to adjust the relative positions thereof and vary the feeding mechanism.

4,501,214

MAST FOR A SAIL

Urs P. Meyer, In der Rehweid 2, CH-8122 Pfaffhausen, Switzerland

Filed May 16, 1983, Ser. No. 494,925

Claims priority, application Switzerland, May 18, 1982, 3079/82

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—39 **16 Claims**

1. A mast for use on a sailcraft, said mast being swivel-mountable at its lower end to the sailcraft so as to be rotatable with respect thereto yet utilizing no bracing attachments anywhere along its length to the sailcraft, said mast having an elongated cross section at every point along its length, thus providing said mast with a narrow front surface, a narrow rear surface and wide opposite side surfaces, the dimensions of the cross sections of said mast changing along its length, each cross section including a longer axis which extends between the narrow front and rear surfaces of said mast and a shorter axis which extends between the wide opposite side surfaces of said mast, the length of the longer axes of the cross sections, when averaged over the lenght of the mast, being at least 2.5 times greater than the length of the shorter axes, such that said mast has a higher flexibility in the direction of said shorter axes than along the direction of its longer axes, said mast being capable of deflecting under the influence of the force applied thereto by an attached sail, itself acted on by a flow of air, said mast being capable of bending to become concave towards the luff side and rotating about its lower end and into the flow of air, based on the sail-applied force.

4,501,215

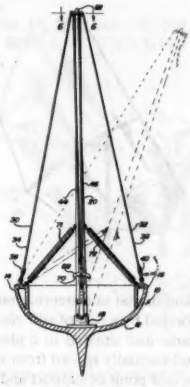
HIGH HEEL ANGLE MAST STAY RELEASE STRUCTURE

Daniel W. Hart, and Helen F. Hart, both of P.O. Box 432, Lanark, Fla. 32323

Filed Aug. 2, 1983, Ser. No. 519,232

Int. Cl.³ B63B *35/00*

U.S. Cl. 114—39 **4 Claims**



1. In combination with a sail boat subject to high heel angles and including a hull having opposite sides between which the lower end portion of an upright mast is pivotally mounted for angular displacement about a fore and aft extending axis, the upper end portion of said mast including mast stay guide means relative to which elongated flexible mast stay may be guidingly engaged for longitudinal displacement relative thereto, at least one pair of elongated flexible stays, anchor means anchoring one pair of corresponding end portions of said stays relative to opposite side portions of said hull, the longitudinal midportions of said stays being guidingly engaged with said guide means and the other pair of corresponding end portions of said stays extending downwardly along said mast away from said guide means, full releasing and manually resettable latch means releasably anchoring the other set of end portions of said stays against upward movement along said mast, said latch means including high heel angle sensing release means operative to fully release the other end portion of said stays for upward movement along said mast responsive to said hull experiencing a high heel angle above a predetermined maximum desired heel angle, and angular displacement resisting means operatively connected between said hull and mast, independent of said stays, operative to yieldingly resist angular displacement of said mast relative to said hull from a predetermined center position of said mast.

4,501,216

SAIL AND RIGGING FOR A SAILING-APPARATUS

Bram J. Voslamber, Duinlustweg 21, 2243 GP Wassenaar, Netherlands

Filed Dec. 20, 1982, Ser. No. 451,365

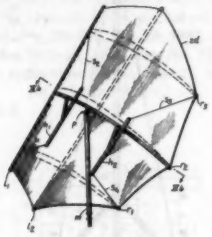
Claims priority, application European Pat. Off., Jan. 6, 1982, 82200007.1

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—102 **7 Claims**

1. A sail for propelling a sailing-apparatus over a surface, said sail having a frame, wherein sailing-cloth is tightened over said frame and whereby the underside comprises the windward side and the upperside comprises the leeside, and wherein the sail is rotatable and pivotable with the aid of steering means in all directions with respect to a supporting body, characterized in that said frame includes stiffening elements comprising girder means interconnected along the length thereof by rib

means extending substantially perpendicular to said girder means, and means are provided for retaining said sailing cloth and said frame in tight proximate relationship for forming substantially stiff wing-type sail means having a design-pressure center of the wind forces acting on the sail when sailing said center lying in a reference axis substantially perpendicular to the longitudinal axis of said sail substantially along which, on the windward side of said sail, is defined a point of support



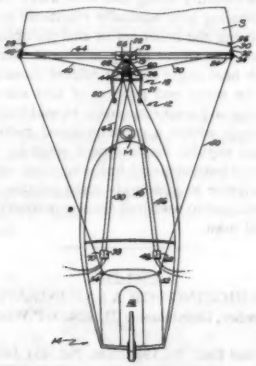
for said frame, and in that said steering means to be controlled by a sailor are formed by a pair of stiff elongated handle means fitted to said frame and situated in a plane on the windward side of said sail substantially spaced from and parallel to the sail and distant from said point of support and said design-pressure center and distant at opposite sides of said point and center for adjusting the position of said point and said center relative to the sailing apparatus.

4,501,217

SPINNAKER POLE CONTROL

John G. Hoyt, #9 Defenders Row, Goat Island, Newport, R.I. 02840

Filed Feb. 24, 1984, Ser. No. 583,372
Int. Cl.³ B63H *9/4*
U.S. Cl. 114—102 **4 Claims**



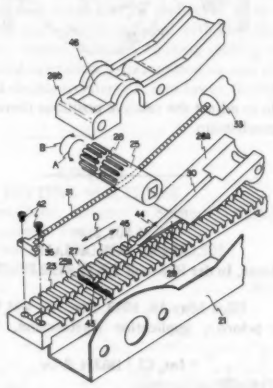
1. In a sailing vessel having a hull with bow and stern sections, a mast supported in a vertical direction from the hull; a rigid support means forward of the mast having means rotatably secured on the upper portion thereof for releasably holding a spinnaker pole, which can slide transversely thereof; that improvement for controlling the pole comprising a pair of control lines, one each attached to an end of said pole and thence led aft through direction changing means at said support means, a pair of clew control lines, each led from the clew of a triangular sail through direction changing means at the bow of the vessel, and thence aft for controlling the sail.

4,501,218

STEERING SYSTEM FOR A BOAT

Makoto Teraura, and Masanao Baba, both of Takarazuka, Japan, assignors to Nippon Cable System, Inc., Takarazuka, Japan

Filed Dec. 30, 1983, Ser. No. 567,290
Claims priority, application Japan, Jul. 20, 1983, 58-132481
Int. Cl.³ B63H *25/02*
U.S. Cl. 114—144 R **9 Claims**



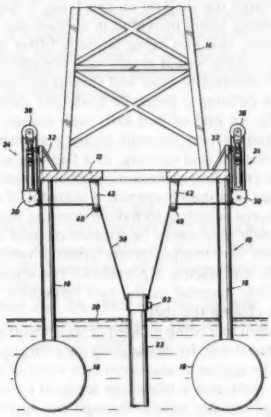
1. A steering system for a boat, comprising:
(a) a rack casing having an opening formed at a center portion or the neighborhood portion thereof; said rack casing being pipe-shaped;
(b) a rack slidably inserted into said rack casing; said rack having a teeth surface side facing said opening; said rack being provided with at least one inner cable path for inserting an inner cable; said inner cable path extending in the longitudinal direction of said rack;
(c) a pinion arranged at said opening; said pinion being meshed with said rack;
(d) at least one inner cable of a push-pull control cable; one end of said inner cable being engaged to an end portion of said rack; the other end of said inner cable being connected to a rudder means or another steering system;
(e) a cable guide having a front end portion inserted into said inner cable path and having at least one guide groove extending from said front end portion to a rear end portion for slidably guiding said inner cable;
(f) an outer casing of said push-pull control cable; one end of said outer casing being connected to said rear end portion of said cable guide; said outer casing slidably guiding said inner cable to said rudder means or said another steering system;
(g) a bracket connecting said cable guide to said rack casing;
(h) a steering shaft having an end portion securely connected with said pinion;
(i) a housing rotatably supporting said steering shaft;
(j) a means for combining said cable guide and said rack casing connected together to said housing;
(k) a small guide groove formed in a bottom surface of said inner cable path; said small guide groove extending along said inner cable path; and
(l) a small projection piece provided at a bottom portion of said front end portion of said cable guide; said small projection being slidably inserted into said small guide groove.

4,501,219

TENSIONER APPARATUS WITH EMERGENCY LIMIT MEANS

Howard J. Bates, Jr., Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,809
Int. Cl.³ E21B *19/08, 19/09*
U.S. Cl. 114—264 **18 Claims**



1. Tensioner apparatus for maintaining a load between an offshore support structure and a marine riser pipe structure comprising:

first and second tensioner bodies, one of said tensioner bodies comprising a cylinder and the other of said tensioner bodies comprising a piston dividing said cylinder into two variable volume chambers, said first and second tensioner bodies being functionally interconnected with said offshore support structure and said marine riser pipe structure respectively whereby relative movement of said structures tends to cause corresponding relative reciprocation of said tensioner bodies, one of said variable volume chambers of said cylinder communicating with a source of pressurized fluid at a relatively high pressure for applying a force between said piston and cylinder tending to reciprocate said piston and cylinder in a first directional mode and thereby applying a generally upwardly directed tensile force to said riser pipe structure, and the other of said variable volume chambers being a balancing chamber communicating with a source of pressurized fluid at a relatively low pressure for resisting reciprocation of said piston and cylinder in said first directional mode, said balancing chamber having outlet means communicating therewith for egress of pressurized fluid from said balancing chamber so as to permit reciprocation of said tensioner bodies in said first directional mode;

limit valve means associated with said outlet means of said balancing chamber and movable between at least two positions, said limit valve means in a first such position communicating a first flow area with said outlet means, and in a second such position communicating a second flow area with said outlet means, said second flow area being substantially less than said first flow area, so as to reduce the rate of fluid flow from the balancing chamber;

actuator means operatively associated with said limit valve means for normally maintaining said limit valve means in said first position but selectively shifting said limit valve means to said second position on receipt of a signal;

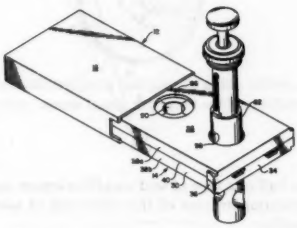
and control means functionally associated with said riser pipe structure and said actuator means for detecting movement of said riser pipe structure independently of the corresponding relative reciprocation of said tensioner bodies in excess of a predetermined limit and producing such signal in response to such movement.

4,501,220

MUSICAL INSTRUMENT VALVE CLEANING/LUBRICATING DEVICE AND METHOD

Lino Biasini, San Jose, Calif.; Americole R. Biasini, and Eivind Clausen, both of Bellingham, Wash., assignors to Allsop, Inc., Bellingham, Wash.

Filed Jun. 15, 1983, Ser. No. 504,382
Int. Cl.³ B05C *1/06, 17/00*; G10G *0/00*
U.S. Cl. 118—73 **25 Claims**



1. A cleaning device particularly adapted to clean a valve element of a musical instrument, where the valve element has a predetermined cross-sectional dimension, said device comprising:

(a) a housing structure defining a first cleaning chamber and a second lubricating chamber;

(b) said housing having a first through recess extending through said first cleaning chamber and a second through recess extending through said second lubricating chamber, said recesses being of a cross-sectional dimension sufficiently large to receive a valve element to be cleaned;

(c) a cleaning pad mounted in said cleaning chamber and having a through recess aligned with the first recess, with a recess defining portion of said cleaning pad being positioned to engage a valve element positioned in the first through recess of the housing;

(d) a lubricating pad mounted in said lubricating chamber, said lubricating pad having a porous structure and being adapted to receive and retain a lubricating medium therein, said lubricating pad being formed with a through recess aligned with said second recess, with a recess defining portion of the lubricating pad being positioned to engage a valve element placed in said second recess in lubricating engagement.

4,501,221

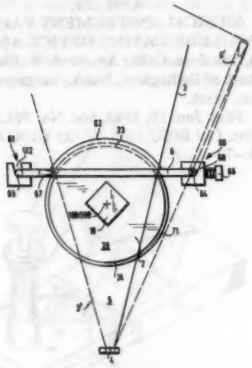
THREAD PARAFFINING DEVICE EMPLOYING A THREAD ELEMENT

Hans Landwehrkamp, Lenting, and Gottfried Schneider, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,996
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228642
Int. Cl.³ B05C *1/06*
U.S. Cl. 118—78 **13 Claims**

1. A thread paraffining device employing a paraffin element, a thread delivery station and a thread take-up device with a thread path extending therebetween, a rotary polyhedral bolt, the axis of which is oriented substantially at right angles to said thread path between said delivery station and said take-up device, a stop, said paraffin element being resiliently biased and slidably mounted towards said thread path and said stop, the improvement comprising:

said stop being a stop rail extending transversely to the thread path direction, said stop rail engaging an area of



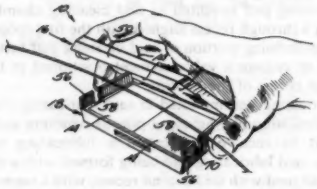
one half of a face of said paraffin element and said thread contacting an area of the other half of said face of said paraffin.

4,501,222

APPLICATOR FOR FISHING LINE DRESSING COMPOSITION

David A. Stone, Glide, Oreg., assignor to Stone Fly Products, Glide, Oreg.

Filed Sep. 21, 1983, Ser. No. 534,388
Int. Cl.³ B05C *1/06*
U.S. Cl. 118—234 **18 Claims**



1. An applicator for applying a dressing composition to a segment of elongated flexible material such as a segment of fly fishing line,

said applicator comprising:

a somewhat flexible plastic container wall means defining a shell enclosing a cavity when in a closed condition, said shell including two openable/closable shell halves each having internally disposed means defining a respective compartment; the two shell halves, when closed, having the two respective compartments arranged in confronting relation to provide said cavity;

the said container wall means of each shell half including an outer face wall and a perimetrically extending skirt wall means;

means hinging one of said shell halves to the other of said shell halves so that said shell may be closed and opened up along an imaginary plane which splits said cavity into said compartments;

each said compartment being constructed and arranged to removably receive an applicator pad constituted by at least one respective applicator pad unit positionable in at least two positions achievable by at least one of:

removing the applicator pad, turning it through part of a circle about an axis that is parallel to its thickness direction and re-inserting it in the respective compartment,

shifting it rectilinearly from one site to another in the compartment, and

removing it, flipping it over and re-inserting it in the respective compartment, with each said applicator pad substantially filling the respective compartment and having a working face disposed in said plane;

means defining two perimetrically widely-spaced openings through the shell on an axis lying in said plane, each said opening being provided in at least one of said skirt wall means, said axis being laterally offset in said plane from one which would divide said compartments into respective identically sized and shaped halves; and

means defining a generally U-shaped guide mounted externally on one of said skirt wall means, each such guide including two sidewall means respectively bracketing a respective said opening, in a flanking sense, and crossing and extending a substantial distance past said plane, so that when said shell is opened, a segment of elongated flexible material which is to have a dressing composition applied thereto may easily be located on said axis in said plane when the compartments contain respective applicator pads, by placing a portion of the segment of elongated flexible material in the two respective U-shaped guides and closing the shell;

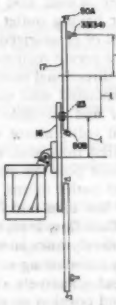
each shell half being molded of such flexible synthetic plastic material that, by modulating the compressive force that he or she applies to said outer face walls in a sense to squeeze the applicator while a line segment to be dressed is being longitudinally moved through the applicator, the user is able to adjust, regulate and modify the amount of dressing being applied to the line segment, the amount of applied dressing being left on the line segment and the extent to which the line segment is longitudinally drawn-out and straightened, even when the line segment being dressed is of graduating transverse cross-sectional area along its length.

4,501,223

COATING APPARATUS

Sadayuki Matsuno, Yokohama; Hiroshi Itoh, Tokyo; Isamu Nishikawa, Yokohama; Tatsuo Awazu, Zushi; Toshio Matsunaga, Tokyo; Yoshitaka Kitaoka; Goro Sugimoto, both of Yokohama, and Hiroki Nishinaka, Amagasaki, all of Japan, assignors to Hitachi Zosen Corporation, Japan

Filed Mar. 21, 1984, Ser. No. 591,400
Claims priority, application Japan, Nov. 30, 1983, 58-227742; Nov. 30, 1983, 58-227743
Int. Cl.³ B05C *7/00*
U.S. Cl. 118—668 **6 Claims**



1. A coating apparatus comprising support means, support moving means for pivotally moving the support means about a horizontal axis, an applicator holder supported by the support

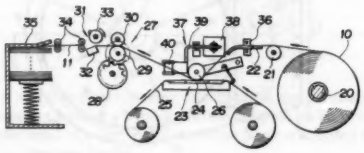
means upwardly and downwardly movably and supporting applicator means, holder drive means for moving the applicator holder upward and downward, position detecting means for detecting the raised or lowered position of the applicator holder or the applicator means, a pair of distance detecting means attached to the support means and arranged one above the other at a distance for detecting the distance from the work surface to be coated, and control means connected to the position detecting means and to the distance detecting means for causing the support moving means to pivotally move the support means in response to detection signals from one of the distance detecting means closer to the applicator means to maintain a substantially constant distance between the applicator means and the work surface.

4,501,224

CONTINUOUS TAG PRINTING APPARATUS

Tooru Shibayama, Kanagawa; Hiroshi Kajiya, Tokyo, and Mitsuharu Takahashi, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jun. 24, 1983, Ser. No. 507,698
Claims priority, application Japan, Jun. 29, 1982, 57-110763
Int. Cl.³ B05C *1/02, 1/16*
U.S. Cl. 118—697 **10 Claims**



1. A continuous tag printing apparatus, comprising:
a feed mechanism for feeding a strip of tags in a feed direction along a feed path;
a printing mechanism along the feed path for printing desired information on each of the tags; and
a mark applying mechanism along the feed path and disposed in the feed direction from the printing mechanism for applying a mark on a portion of a side surface of the strip at a location which corresponds to a portion of the strip at which information being printed on the tags changes.

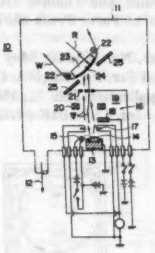
4,501,225

APPARATUS FOR MAKING A MAGNETIC RECORDING MEDIUM

Makoto Nagao; Akira Nahara, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 368,861, Apr. 15, 1982,. This application Mar. 15, 1984, Ser. No. 589,701
Claims priority, application Japan, Apr. 24, 1981, 56-62055
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—718 **7 Claims**

1. An apparatus for making a magnetic recording medium at least comprising, in a vacuum, a means for heating and evaporating a deposition material, a hearth for containing said deposition material, a pair of guide rollers located at different heights above said hearth, and a fixed curved guiding means having a curved surface which is convex downwardly and capable of slidably guiding a flexible substrate moved in



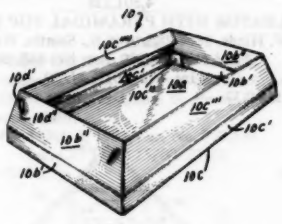
contact therewith between said pair of guide rollers, said fixed curved guiding means being provided with oscillators.

4,501,226

DISPOSABLE PET LITTER CONTAINER

Gerald A. Bienvenu, and E. Gayle Bienvenu, both of 208 State St., Newburgh, Ind. 47630

Filed Mar. 26, 1984, Ser. No. 593,585
Int. Cl.³ A01K *23/00*; B65D *5/22*
U.S. Cl. 119—1 **8 Claims**



1. A container for receiving pet litter material comprising:
in an integral folded relationship, a bottom wall, side walls and end walls, said side and said end walls having lower portions and upper portions, means securing said lower portions of said side and said end walls together, other portions depending from said upper portions of said side walls and angling downwardly and inwardly towards each other, said lower portions of said side and said end walls extending upwardly in a generally vertical plane with respect to said bottom wall, said upper portions of said side walls and said upper portions of said end walls angling inwardly towards each other, and means interconnecting said other portions of said side walls with said upper portions of said end walls in a selectively assembled relationship, said interconnecting means including said upper portions of said end walls including pairs of slots and said other portions of said side walls including tabs extending within and secured to the slots of said upper portions of said end walls.

4,501,227

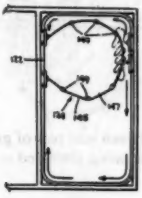
METHOD AND APPARATUS FOR REARING POST-LARVAE SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Continuation of Ser. No. 263,500, May 14, 1981, abandoned, which is a division of Ser. No. 952,664, Oct. 18, 1978, Pat. No. 4,285,298. This application Feb. 21, 1984, Ser. No. 580,769

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—2 **2 Claims**



1. A method of transferring post-larvae shrimp from a tank having a closeable opening in a sidewall comprising:

culling from the total population of shrimp in said tank a shrimp subpopulation comprising shrimp which have undergone a preselected period of growth, said step of culling including surrounding said total population of shrimp with a net having mesh openings of a size approximately equal to the size of shrimp forming said shrimp subpopulation and inducing shrimp smaller than those forming said shrimp subpopulation to move through said mesh openings by constricting said net around said total population of shrimp;

confining said culled shrimp in a localized area of said tank including said closeable opening;

and opening said closeable opening.

4,501,228

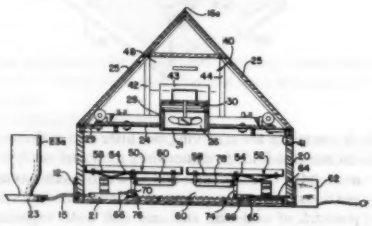
INCUBATOR WITH PYRAMIDAL TOP PORTION

Philbirt F. Hinds, 1804-28th Ave. S., Seattle, Wash. 98144

Filed Dec. 9, 1982, Ser. No. 448,353

Int. Cl.³ A01K *41/00*

U.S. Cl. 119—37 **6 Claims**



1. An incubator, comprising:

a shallow lower compartment containing means for supporting eggs therein, including means for rotating the eggs through a selected angle;

an upper compartment comprising a base plate and a top cover portion extending over and above said base plate, said upper compartment including an opening around the periphery of said base plate adjacent the lower edge of said top cover portion and a central opening in the base plate, so as to permit air communication between said upper and lower compartments through said central opening and said peripheral opening;

a cylindrical wall means extending upwardly from about said central opening and downwardly slightly below the lower surface of said base plate;

a horizontal air baffle plate, separate from said top cover portion, being positioned above, but relatively close to, the upper edge of said cylindrical wall means, said horizontal baffle plate being substantially larger than the cross-sectional area of said cylindrical wall means but substantially smaller than the area of said base plate;

heating means located substantially closer to the upper edge of said cylindrical wall means then to said peripheral opening; and

fan means located in said cylindrical wall means for circulating the air between said upper and lower compartments through said central opening and said peripheral opening, so that warm air circulates about the eggs in the lower compartment.

4,501,229

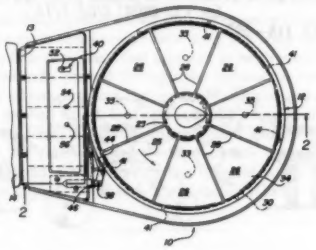
AUTOMATIC ANIMAL-FEEDING DEVICE

Robert L. Williamson, 15155 El Soneto, Whittier, Calif. 90603

Filed Oct. 7, 1983, Ser. No. 540,139

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—51.12 **2 Claims**



1. An animal-feeding apparatus comprising:

a base-support member;

a cover removably mounted on said base-support member and having an aperture formed therein;

a food tray having a central hub member and an outer annular wall, said hub member having an opening therein;

a plurality of circumferentially disposed food compartments interposed between said central hub and said outer wall of said food tray, whereby said compartments are arranged to be sequentially positioned under said aperture in said cover;

a tray-drive means comprising a fixed central hub member secured to said base-support member, a cap member rotatably mounted in said fixed hub member for limited movement thereon and adapted to be coupled to said food tray, whereby said food tray rotates therewith, and means disposed in said fixed hub member to rotate said cap member;

wherein said fixed central hub member includes a central opening adapted to rotatably receive said cap member therein, said cap member being formed having an irregular-shaped boss member adapted to be received in a matching opening formed in said central hub of said food tray, whereby said food tray is rotated with said cap;

means formed between said cap member and said fixed hub member to limit the rotation of said cap member;

wherein said limit means comprises a stop member formed on said fixed hub member, and a depending tongue member formed on said cap member positioned to engage said stop member, whereby said cap member is restricted to one revolution;

releasable latching means arranged to engage said food tray

for sequential positioning of said food compartments under said cover aperture;

wherein said latching means comprises a biased latching arm, a plurality of ear members formed on said annular wall of said food tray arranged to be engaged by said latching arm, and a solenoid attached to said latching arm whereby said latching arm is sequentially disengaged from said ear member to allow said tray to selectively rotate for repositioning of said food compartments;

timing means connected to said releasable latching means for sequentially activating said latching means; and

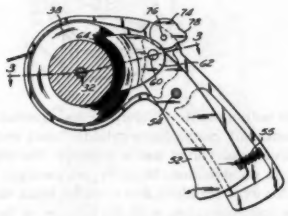
power-supply means adapted to activate said releasable latching means and said timing means.

4,501,230

RETRACTING AND LOCKING ANIMAL LEASH

Arnold T. Talo, 16522 Monroe La., Huntington Beach, Calif. 92647

Filed Jan. 10, 1983, Ser. No. 456,829
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—109 **8 Claims**



1. A retracting and locking animal leash device comprising:

a housing having a handle portion adapted to be grasped in the hand of a user and a reservoir portion adapted to store an elongate leash;

a spool rotably mounted within said reservoir portion;

an elongate leash positioned about said spool and extensible from said reservoir portion;

means positioned within said reservoir portion for biasing said spool in a rotational direction to continuously urge said leash in a retracted orientation about said spool;

a pair of conical shaped pad members positioned within said reservoir portion actuable to frictionally engaging said spool and preventing rotation of said spool;

a trigger level pivotally mounted to said handle portion for actuating said brake means into frictional engagement with said spool; and

locking means cooperating with said trigger lever for selectively maintaining said brake means in engagement with said spool; said spool having a pair of perripheral recesses formed in a complimentary configuration to said pair of conical-shaped pad members and said pair of conical-shaped pad members being mounted to said trigger lever.

4,501,231

HEATING SYSTEM WITH LIQUID PRE-HEATING

Eugene W. Perkins, Dawsonville, Ga. 31742

Filed Jun. 2, 1983, Ser. No. 500,346
Int. Cl.³ F22B *3/06*
U.S. Cl. 122—26 **2 Claims**

1. A heating system comprising:

(a) a heater for liquids comprising:

i. a housing having a chamber defined by a cylindrical wall having a horizontal axis, and end walls,

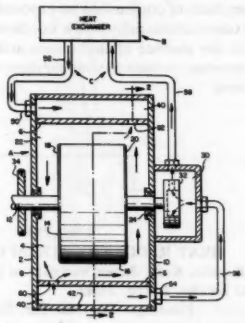
ii. a shaft rotatably mounted co-axially within the housing chamber,

iii. a rotor mounted on the shaft within the housing chamber and having a cylindrical external surface spaced inwardly from the cylindrical inner surface of the housing chamber thereby defining an annular space between the two cylindrical surfaces,

iv. a pump chamber co-axial with the rotor chamber and having within it a pump mounted on the shaft,

v. means for rotating the rotor and the pump,

(b) a cylindrical wall surrounding and spaced from the cylindrical wall of the rotor chamber and defining a cylindrical jacket chamber surrounding the rotor chamber having inlet and outlet ports which are, respectively, at the upper and lower parts and at axially opposite ends of the jacket chamber,



(c) a heat exchanger external to the liquid heater and having inlet and outlet ports,

(d) tubing connecting the outlet port of the heat exchanger tubing to the jacket chamber inlet port,

(e) tubing connecting the outlet port of the jacket chamber to the inlet port of the heat exchanger tubing,

(f) a port connecting the rotor and jacket chambers which is positioned beneath the jacket chamber inlet port, and

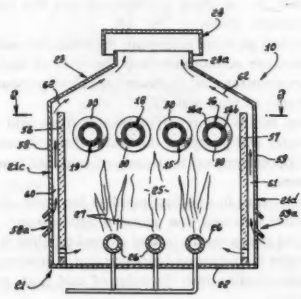
(g) a second port connecting the rotor and jacket chambers which is positioned above the jacket chamber outlet port.

4,501,232

POOL OR SPA WATER HEATER

Manochehr Gordbegli, Santa Ana, and Sangchol An, Rolling Heights, both of Calif., assignors to Purex Pool Products, Inc., Lakewood, Calif.

Filed Oct. 3, 1983, Ser. No. 538,550
Int. Cl.³ F22B *15/00, 25/00*
U.S. Cl. 122—235 C **13 Claims**



1. In a pool or spa water heater, the combination comprising:

(a) a housing containing a combustion chamber,

(b) gas burner means associated with the housing to produce hot products of combustion rising in said chamber,

(c) a heat exchanger associated with said chamber in the

path of said products of combustion to transfer heat to water flowing through said exchanger,

(d) said exchanger including inner and outer metal tubes, said outer tubes extending openly in the direct path of said hot products of combustion for transferring heat from the outer to the inner tubes and then to water flowing in the inner tube or tubes, said tubes having metal to metal contact, the outer tubes located about the inner tubes,

(e) and means including sufficient non-metallic and flowable heat transfer material in gaps formed between the tubes and along their lengths for reducing condensation of moisture from said products of combustion on exposed surfaces carried by the outer tubes substantially below condensation levels that would exist in the absence of said means and inner tubes, the inner tube external surface having random contact with the outer tube bore.

4,501,233

HEAT RECOVERY STEAM GENERATOR

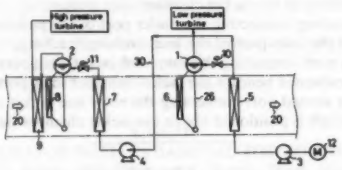
Iwao Kusaka, Kure, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,820

Claims priority, application Japan, Apr. 24, 1982, 57-69229; Apr. 24, 1982, 57-69230

Int. Cl.³ F22D *7/00*

U.S. Cl. 122—406 S **13 Claims**



1. A heat recover boiler equipment, comprising:

a high pressure boiler drum and a high pressure evaporator operatively connected together;

a low pressure boiler drum and a low pressure evaporator operatively connected together;

a low pressure economizer and a high pressure economizer;

a first pipeline operatively extending between the outlet of said low pressure economizer and the inlet of said low pressure drum;

a second pipeline extending between the outlet of said low pressure economizer and the inlet of said high pressure economizer, and bypassing said low pressure boiler drum;

a source of feed water;

pump means for receiving water from said source of feed water and pumping the water through said low pressure economizer and into each of said first and second pipelines;

valve means in said first pipeline for controlling the flow of water into said low pressure boiler drum;

second pump means in said second pipeline for pumping the water in said second pipeline that is downstream from said first pipeline into the inlet of said high pressure economizer;

a third pipeline operatively extending between the outlet of said high pressure economizer and the inlet of said high pressure boiler drum; and

valve means in said third pipelines leading to the inlet of said high pressure boiler drum for providing flow control into said high pressure boiler drum from said third pipeline.

4,501,234

BLOW-BY GAS PASSAGE SYSTEM FOR INTERNAL COMBUSTION ENGINES

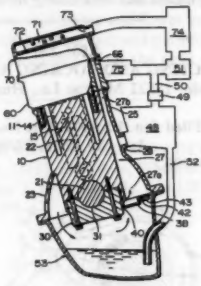
Susumu Toki, and Kenichi Nagahiro, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,983

Claims priority, application Japan, Nov. 15, 1982, 57-172480[U]

Int. Cl.³ F02F *9/02*

U.S. Cl. 123—41.86 **5 Claims**



1. For use with a multi-cylinder internal combustion engine having a crankshaft, crankcase, a cylinder block and a cylinder head with overhead valves and a breather, the improvement comprising, in combination: blow-by gas passages formed on one side of the cylinder block and cylinder head, said blow-by gas passages communicating with the interior of the crankcase and extending above an upper face of the cylinder head in communication with the breather, one of said blow-by passages being provided with a mounting port, an oil separator carried on said mounting port, means connecting only said one blow-by passage to said separator, and means connecting the separator and breather to the intake system of the engine.

4,501,235

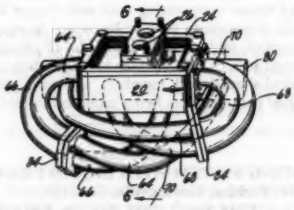
TUNED ENGINE INTAKE MANIFOLD

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 4, 1983, Ser. No. 482,098

Int. Cl.³ F02M *35/10*

U.S. Cl. 123—52 M **11 Claims**



1. A compact tuned intake manifold for a multi-cylinder automotive type internal combustion engine having a cylinder head comprising,

a plenum adapted to receive therein an air/fuel mixture charge for flow distribution to the engine cylinder head through separated manifold runners connected to the plenum, the plenum having diametrically opposite sides therein on opposite sides of the centerline of the plenum,

at least one tubular runner extending directly from each of outlets in the diametrically opposite sides of the plenum to

intake ports in the engine cylinder head without interconnection of the flow of the charge between the runner,

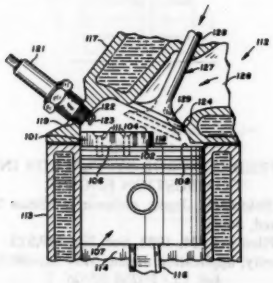
the runners each being extended in length a distance sufficient to tune the runner and being coiled unidirectionally in essentially a horizontal plane for approximately 270° from its respective outlet past the plenum centerline and beneath a diametrically opposite side of the plenum to a respective intake manifold port to provide a compact tuned manifold, with the runners extending from the diametrically opposite outlets crossing one another.

4,501,236

METHOD AND APPARATUS FOR REDUCING DAMAGE ASSOCIATED WITH DETONATION AND/OR DESTRUCTIVE KNOCK

Edward A. Fletcher, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 9, 1982, Ser. No. 406,484
Int. Cl.³ F02B 75/04
U.S. Cl. 123—193 P **15 Claims**



1. A piston for attenuation of detonation in an internal combustion engine having a combustion chamber accommodating and air/fuel mixture, said mixture when ignited forming a flame front that propagates across the combustion chamber comprising: a cylindrical side wall, a top wall having a center being secured to the side wall, and cap means joined to the top wall, said cap means having a generally semi-circular outer edge curved to conform to the size and shape of the cylindrical side wall, said outer edge being a flush extension of a semi-circular portion of the cylindrical side wall, said cap means having a transverse wall projected generally upwardly from said top wall extended between opposite ends of the semi-circular outer edge, said transverse wall having a convex curve with a radius greater than that of a radius of said top wall being entirely on one side of a plane passing through said center opposite that of a radius center located on said outer edge midway between the ends thereof, in contiguous relation to the ignition point of air/fuel mixture in the combustion chamber, said transverse wall being located generally normal to the direction of movement of the flame front commencing from the ignition point in the combustion chamber.

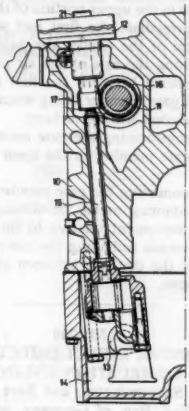
4,501,237

CONTROL UNIT FOR THE LUBRICATING OIL CIRCULATION PUMP AND FOR THE FUEL INJECTION SYSTEM REGULATOR OF DIESEL ENGINES

Luigi Pitozzi, Brescia, Italy, assignor to SAME S.p.A., Treviglio, Italy

Filed Jul. 18, 1983, Ser. No. 514,708
Claims priority, application Italy, Jul. 16, 1982, 22420/82[U]
Int. Cl.³ F02M 1/00
U.S. Cl. 123—196 W **2 Claims**

1. A control unit for a lubricating oil circulation pump and for a fuel injection system regulator of a diesel engine of the type having a cylinder block in which an engine camshaft is rotatable, wherein said regulator is mounted on said cylinder block externally thereto and the unit comprises a control shaft extending through said cylinder block substantially perpendicularly to said camshaft between a lubricating oil sump and said



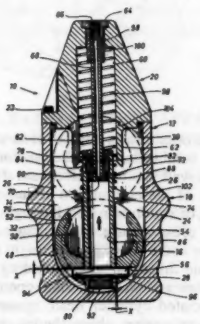
regulator, said control shaft being operationally connected at an intermediate point thereof to said camshaft and having opposite ends respectively connected to said pump and said regulator for rotation thereof.

4,501,238

ENGINE AIR INTAKE SHUT-OFF VALVE

Charles E. Odum, 1616 W. Belt N., Houston, Tex. 77043

Filed May 3, 1983, Ser. No. 491,032
Int. Cl.³ F02B 77/08
U.S. Cl. 123—198 D **7 Claims**



1. A shut-off valve for restricting air flow to or from an engine comprising:

a. a housing defining a cavity therein, the cavity comprising an upper portion and a lower portion;

b. an air passage extending through the housing and being alignable with an engine air intake line, the air passage comprising axially aligned first and second ports extending through opposed sides of the housing and also comprising the lower portion of the cavity intermediate the first and second ports;

c. a first seating surface extending around the periphery of the first port and comprising a portion of an interior surface of the housing;

d. a second seating surface extending around the periphery

of the second port and comprising a portion of an interior surface of the housing;

e. a gate member residing in the cavity, the gate member being reciprocable in the cavity in a direction perpendicular to the aligned axes of the first and second ports from an open position in the upper portion of the cavity to a closed position intermediate the first and second ports in the lower portion of the cavity, the gate member having a dimension along the axis of the air passage smaller than the axial distance between the first and second seating surfaces, the gate member being seatable directly against the first or second seating surface;

f. means for reciprocating the gate member into and maintaining the gate member in the open or closed position; and

g. means for connecting the gate member to the reciprocating and maintaining means permitting the gate member freedom of movement relative to the reciprocating and maintaining means and along the axis of the air passage to the extent of the distance between the first and second seating surfaces.

4,501,239

AIR-COMPRESSING, DIRECT-INJECTION INTERNAL COMBUSTION ENGINE

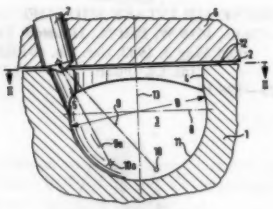
Friedrich Bauer, Schwanstetten, and Kurt Leonhard, Nuremberg, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed May 27, 1982, Ser. No. 382,581

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121344

Int. Cl.³ F02B *23/06*

U.S. Cl. 123—261 **10 Claims**



1. An internal combustion engine, each piston of which has a crown and a combustion chamber including a longitudinal axis as well as a wall in a circumferential direction along with a lower quarter of the combustion chamber and being in the shape of a solid of revolution and having a constricted throat opening of oval cross section with a major diameter as well as a minor diameter and a varying wall height in the circumferential direction, said throat opening including an edge and being located in the crown of said piston and opening in the direction toward an associated cylinder head; means are provided for imparting a rotary motion, about the longitudinal axis of said combustion chamber, to in-flowing air for combustion; an injection nozzle is arranged off-center in said cylinder head in the vicinity of the edge of said throat opening and has a fuel jet discharge point communicating with said combustion chamber for injecting fuel therein, said fuel being injected into said combustion chamber in the form of a single jet, in the direction of rotating air for combustion, in such a way as to permit formation of a fuel film on the wall of said combustion chamber, with the point of impingement of said fuel jet on the wall of said combustion chamber being located in the lower quarter of said combustion chamber by appropriate selection of the nozzle angle and nozzle position; viewing said combustion chamber in a top view thereof, the major diameter of said throat opening, across the center of said combustion chamber, extends in the direction toward said fuel jet discharge point of said injection nozzle, with the distance of said fuel jet discharge point from the center of said combustion chamber being 0.35 to 0.70 times the diameter of said combustion chamber, and with the direction of a fuel jet, on the one hand being geometrically projected in a plane intersecting at a right angle to the longitudinal axis of said combustion chamber, forming an angle of 10° to 50° with a straight line extending from said fuel jet discharge point through the longitudinal axis of said combustion chamber (center of said combustion chamber), and on the other hand forming an angle of 20° to 60° with a plane intersecting at a right angle to the longitudinal axis of said combustion chamber; said combustion chamber being spherical; the distance of said fuel jet discharge point from the center of said combustion chamber being 0.50 to 0.55 times the diameter of said combustion chamber; said angle of said direction of a fuel jet with said straight line from said fuel jet discharge point being between 15° and 40°; said angle of said direction of a fuel jet with a plane at a right angle to the longitudinal axis of said combustion chamber being between 40° and 50°; and the ratio of the major diameter of said oval throat opening to the minor diameter thereof being in a range from 1.10 to 1.15.

4,501,240

IDLING SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

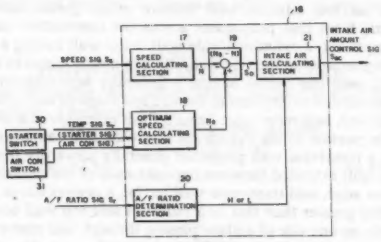
Shigeo Aono, Sekimachi, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 24, 1983, Ser. No. 469,513

Claims priority, application Japan, May 11, 1982, 57-77535

Int. Cl.³ F02M *23/06*

U.S. Cl. 123—339 **13 Claims**



1. An idle speed control system for an internal combustion engine having a throttle, a bypass means for providing to said engine intake air bypassing said throttle, an engine speed detector providing an engine speed signal, an optimum engine speed calculating means providing an optimum engine speed signal, and an air-fuel ratio detector providing an air-fuel ratio signal indicating a rich or lean fuel mixture, comprising:

intake air adjusting means including,

calculating means for calculating a basic amount of bypass air to be provided to said engine as a function of a difference between said optimum engine speed signal and said engine speed signal, and

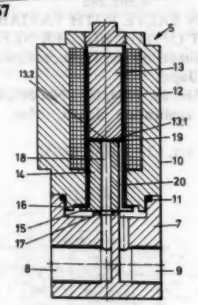
correcting means for correcting the basic amount of bypass air calculated by said calculating means as a function of said air-fuel ratio signal, and further comprising

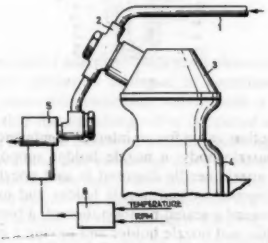
air flow adjusting means connected to said intake air adjusting means for providing a quantity of air passing through said bypass means corresponding to the corrected basic amount determined by said correcting means.

4,501,241
GOVERNOR FOR A DIESEL ENGINE

Albert Nolte, and Gerd Wallenfang, both of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 477,893
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210903
Int. Cl.³ F02D 31/00
U.S. Cl. 123—367 7 Claims





1. In a governor system for a fuel injection pump of a diesel engine, the governor system including an adjustment means for adjusting the position of an adjustable stop for a movable control rod of the fuel injection pump, the adjustment means being connected to a pipe means through which pressurized fluid flows in one direction, the operation of the adjustment means being based on the pressure of the fluid in the pipe means, and the pressure of the fluid in the pipe means being in turn based on various operating parameters of the engine, the improvement wherein

said adjustment element is connected along the length of the pipe means, such that the pipe means has an upstream portion and a downstream portion with respect to said adjustment element,

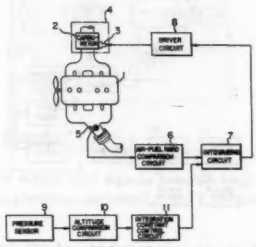
a spring-less solenoid valve connected to the downstream portion of said pipe means which is capable of controlling the pressure of the fluid in said pipe means by blow off through a discharge port, said solenoid valve including a flow channel therethrough which connects with said discharge port, a piston armature which has a front end and a rear end movably mounted within the solenoid valve, the front end of the piston being capable of controlling the flow area through said flow channel, and electrical means for creating a magnetic field for determining the positioning of said piston within the solenoid valve, and

a control means electrically connected to said electrical means for determining the magnetic field generated thereby, said control means receiving signals indicative of said various operating parameters.

4,501,242
AIR-FUEL RATIO CONTROL APPARATUS

Yukihide Niimi, Kariya; Seietsu Yoshida, Aichi, and Hidemi Ohnaka, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 1, 1983, Ser. No. 481,232
Claims priority, application Japan, Apr. 1, 1982, 57-54223
Int. Cl.³ F02M 7/12
U.S. Cl. 123—440 1 Claim



1. In an air-fuel ratio control apparatus including an oxygen concentration detecting circuit for detecting the concentration of oxygen in an exhaust gas from an engine of a vehicle and comparing a detection signal with a predetermined value preset in correspondence to a predetermined air-fuel ratio to generate a first difference signal, an integrating circuit responsive to said first difference signal to generate an integration signal and an air-fuel ratio control circuit responsive to said integration signal to generate a control signal for energizing air-fuel ratio control means, the improvement comprising:

an altitude detecting circuit for detecting an atmospheric pressure outside said vehicle and comparing a detection signal with a preset value set in correspondence to a predetermined altitude to generate a second difference signal; and

an integration control circuit responsive to said second difference signal to control a circuit constant of said integrating circuit.

4,501,243
AIR-FUEL RATIO CONTROL APPARATUS

Yukihide Niimi; Kenzi Kinoshita, both of Kariya, and Masahiro Urushidani, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 29, 1983, Ser. No. 489,949
Claims priority, application Japan, Apr. 30, 1982, 57-72860
Int. Cl.³ F02M 7/10
U.S. Cl. 123—440 7 Claims

1. An air-fuel ratio control apparatus for an internal combustion engine comprising:

oxygen concentration detecting means for detecting a concentration of oxygen in an exhaust gas from the engine and comparing a detection signal with a reference value corresponding to a stoichiometric air-fuel ratio to generate a difference signal;

integrating means for integrating the difference signal to generate an integration signal;

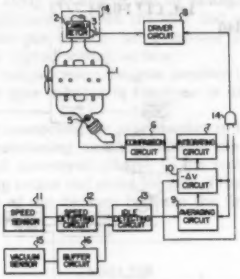
driver means responsive to the integration signal to control a driving current of air-fuel ratio control means;

intake pressure detecting means for detecting an intake pressure in said engine and generating an intake pressure detection signal in accordance with said intake pressure;

speed detecting means for detecting a rotational speed of said engine and comparing the same with a reference value corresponding to a predetermined engine speed to generate a speed detection signal;

idle detecting means responsive to said intake pressure detection signal and said speed detection signal to detect an idling condition of said engine and generate an idle detection signal;

air-fuel ratio control halting means responsive to said idle detection signal to apply an air-fuel ratio control stop signal to said driver means;



average value means responsive to said idle detection signal to average said integration signal and generate an average value signal; and

average value hold means for decreasing said average value signal by a predetermined value and using said decreased value as an integration initial signal when said engine comes into an acceleration operation from said idling condition.

4,501,244

FUEL INJECTION PUMPING APPARATUS

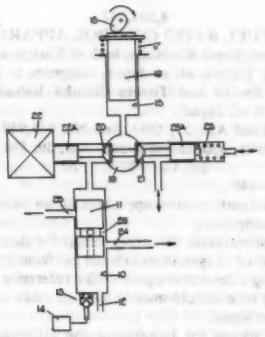
Boaz A. Jarrett, London; Ivor Feane, Greenford; David F. Lakin, London, and Dorian F. Mowbray, Burnham, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 29, 1983, Ser. No. 509,038

Claims priority, application United Kingdom, Jul. 15, 1982, 8220492

Int. Cl.³ F02D *1/02*

U.S. Cl. 123—446 **6 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine of the kind comprising a fluid pressure operable piston located within a cylinder, an outlet from one end of the cylinder, first valve means through which fuel can be admitted to said one end of the cylinder, a plunger reciprocable within a bore, an engine driven cam for actuating said plunger, a passage connecting one end of said bore with the other end of said cylinder, second valve means operable to allow fluid under pressure displaced from said bore during inward movement of said plunger by the cam, to flow to said other end of the cylinder thereby to displace the piston and cause fuel flow through the outlet, and means for sensing the relative angular movement of the cam and plunger during the period fuel is allowed to enter said one end of the cylinder, the angular movement of the cam being representative of the axial movement of the piston.

4,501,245

FUEL INJECTION VALVE WITH VARIABLE LIFTING AMOUNT OF THE NOZZLE NEEDLE

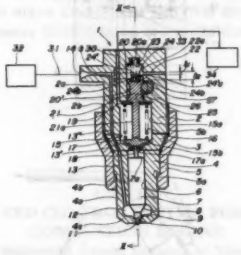
Shigeo Taira, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,425

Claims priority, application Japan, Mar. 25, 1983, 58-42788[U]

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—446 **10 Claims**



1. A fuel injection valve for an internal combustion engine, comprising: a nozzle body; a nozzle holder supporting said nozzle body; a nozzle needle disposed in said nozzle body; a nozzle spring disposed in said nozzle holder and urging said nozzle needle toward a seated position thereof; a piston chamber formed within said nozzle holder and having a closed end portion remote from said nozzle needle; a piston received within said piston chamber, said piston being liftable together with said nozzle needle and rotatable about an axis thereof, said piston having an end face remote from said nozzle needle and an outer peripheral surface; a fluid passage opening in said piston chamber for supplying and discharging pressurized fluid to and from said piston chamber, said fluid passage being disposed to be closed by said piston when said piston is lifted, whereby after thus closing said fluid passage during lifting, said piston defines a closed space in said piston chamber in cooperation therewith, whereby lifting of said piston is interrupted; a return spring urging said piston toward said nozzle needle; and rotating means for rotating said piston about said axis thereof; said end face of said piston remote from said nozzle needle being so configurated that said piston lifts through a stroke variable as said piston varies in circumferential position, from the time said nozzle needle starts lifting to the time said piston closes said fluid passage.

4,501,246

FUEL INJECTION PUMP

Jean Leblanc, Lyons, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1982, Ser. No. 397,712

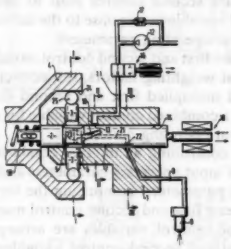
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128975

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—449 **5 Claims**

1. A fuel injection pump having at least one pump work chamber enclosed in a cylinder by at least one pump piston, which is actuated by cam means in synchronism and constant relation to drive means of said injection pump, said pump work

chamber being in continuous communication with a distributor opening in an axially displaceable distributor shaft which is rotated by said drive means in synchronism therewith within a cylinder and is capable of being connected thereby with one of a series of supply lines distributed over the circumference of said cylinder which lead from said cylinder to a fuel injection point, said point being effected in sequence during the supply stroke of said pump piston, further wherein said pump work chamber is in continuous communication with a control groove in a jacket face of said distributor shaft, with control groove arranged to cooperate with a fuel inlet opening which discharges into said cylinder and wherein the rotary and axial position of a part of said control groove that coacts with said fuel inlet opening relative to said drive means is variable by an



axial displacement of said distributor shaft characterized in that said fuel inlet opening is arranged to communicate via an electrically actuatable switching valve with a fuel supply source such that the switching valve is opened after the fuel inlet opening has been closed by a trailing limiting edge of said control groove, and said switching valve is closed at variable points of rotation of the distributor after a leading control edge of said control groove has again opened the fuel inlet opening and a desired amount of fuel has been admitted through said control groove, thereby changing in cooperation with the relative rotary position of said control edge of said control groove the instant and quantity of the fuel to be injected and further that said distributor shaft is axially displaceable by means of an electrical adjusting device for changing that relative rotary position of the control groove.

4,501,247

ELECTRONICALLY CONTROLLABLE AND REGULATABLE FUEL METERING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Hermann Gässler, Vaihingen/Enz; Eugen Joos, Löchgau; Hans Kubach, Korntal-Münchingen; Wolfgang Maisch, Schwieberdingen, and Erich Singer, Besigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

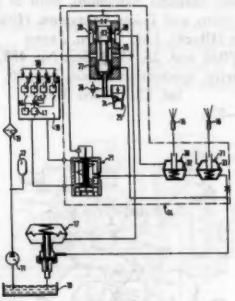
Filed Sep. 7, 1982, Ser. No. 415,047

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204548

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—453 **6 Claims**

2. An electronically controllable and regulatable fuel metering system including fuel metering means in an internal combustion engine, in particular, a continuously functioning injection system, having sensors for sensing operating variables, a control unit, a final control means for influencing the fuel metering means, said control unit comprising means for providing a regulated direct current signal combining clock signal components for controlling said final control means, said clock signal components being dependent on said operating variables, and an electrical summing point preceding said final



control means to which said signals relating to post-starting, warm-up and acceleration enrichment are delivered.

4,501,248

APPARATUS FOR ASCERTAINING CONTROL VARIABLES IN AN INTERNAL COMBUSTION ENGINE

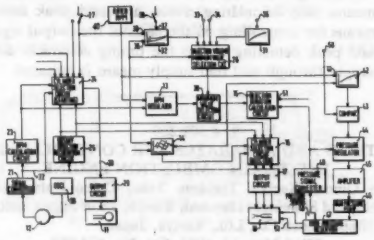
Hermann Eisele, Schwieberdingen, and Bruno Frank, Möglingen both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 243,180, Mar. 12, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 482,107

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009627

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—478 **12 Claims**



1. An apparatus for computing nominal value signals for fuel metering and for starting procedure, at least one of values for fuel metering onset, fuel metering duration and switching points of starting airvalves, and for individual cylinders in an internal combustion engine, particularly a Diesel engine comprising

means for generating measurement results to individual operating parameters of said engine,

computer means for computing said nominal value signals for each said individual cylinder responsive to said measurement results of said generating means wherein the nominal value signals for the nth combustion process of said internal combustion engine and for one of said individual cylinders are computed in the period of time between the (n−1)th and nth combustion process of said internal combustion engine and,

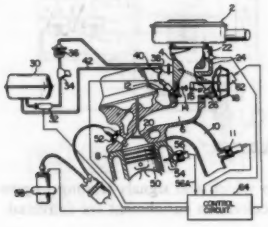
output means responsive to said nominal value signals for controlling the operating parameters of said engine.

4,501,249

FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Matsuo Amano; Shinichi Sakamoto, both of Hitachi; Takeshi Hirayama, Mito, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,453
Claims priority, application Japan, Apr. 26, 1982, 57-68692
Int. Cl.³ F02M 51/00
U.S. Cl. 123—478 6 Claims



1. A fuel control apparatus for an internal combustion engine which includes at least one cylinder and an intake passage for introducing intake air into said cylinder through an intake valve, comprising:

fuel supply means for supplying fuel to said intake passage of the internal combustion engine;

sensor means for detecting flow velocity of the intake air in said intake passage to produce an output signal representative of said flow velocity;

calculating means for responding to the output signal of said sensor means to arithmetically determine the amount of fuel to be supplied through said fuel supply means;

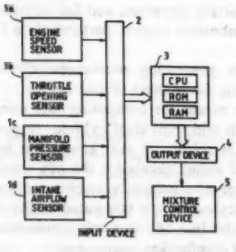
peak detecting means connected to said sensor means for detecting a peak of the output signal of said sensor means; and timing control means connected to said fuel supply means, said calculating means and said peak detecting means for controlling on the basis of the output signal of said peak detecting means the timing at which the fuel supply through said fuel supply means is initiated.

4,501,250

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Norio Omori, Kariya; Tsutomu Tabe, Chita; Katsunori Ito, Aichi, and Shuukichi Hayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 14, 1983, Ser. No. 474,982
Claims priority, application Japan, Mar. 15, 1982, 57-41133
Int. Cl.³ F02M 51/00
U.S. Cl. 123—486 17 Claims



1. An apparatus for controlling an internal combustion engine having a plurality of input operating parameters, comprising:

a plurality of sensors for detecting first, second and third output operating parameters of said engine; and

a microcomputer having at least first and second control maps in which first and second control variables are arranged respectively, said first and second control variables being addressible in response to different combinations of said detected output operating parameters, said microcomputer being programmed to execute the following steps:

(a) deriving first and second weighting factors;

(b) addressing said first control map to derive a said first control variable in response to the detected first and second output operating parameters;

(c) addressing said second control map to derive a said second control variable in response to the detected second and third output operating parameters;

(d) multiplying said first and second control variables by said first and second weighting factors, respectively; and

(e) summing said multiplied first and second control variables to derive a combined control variable for controlling one o. said input operating parameters.

9. A method for controlling an internal combustion engine having a plurality of input operating parameters and a plurality of output operating parameters, comprising the steps of:

(a) providing at least first and second control maps in which first and second control variables are arranged respectively, said first and second control variables being addressible in response to different combinations of said output parameters;

(b) detecting first, second and third output operating parameters of said engine;

(c) deriving first and second weighting factors;

(d) addressing said first control map to derive a said first control variable in response to the detected first and second output operating parameters;

(e) addressing said second control map to derive a said second control variable in response to the detected second and third output operating parameters;

(f) multiplying said first and second control variables by said first and second weighting factors, respectively; and

(g) summing said multiplied first and second control variables to derive a combined control variable for controlling one of said input operating parameters.

4,501,251

BOOSTER PUMP ARRANGEMENT FOR FEEDING A SECONDARY CIRCULATION SYSTEM IN THE OPERATIVE SYSTEM OF A DIESEL ENGINE

Heinz Kelch, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,279
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304723
Int. Cl.³ F02M 41/00
U.S. Cl. 123—495 1 Claim

1. A fuel system for a diesel engine comprising:

a primary fuel circulation system;

an injection pump and a fuel pump for said primary fuel circulation system, said fuel pump consisting of a mechanical piston pump operatively associated with said injection pump and operating to pump fuel for said primary circulation system;

a pump crankshaft and eccentric means in said injection pump for actuating said fuel pump;

a piston chamber in said fuel pump having an end wall located away from said eccentric means;

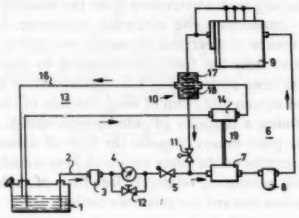
threaded means in said end wall adapted to receive therein a threaded plug in sealing engagement therewith;

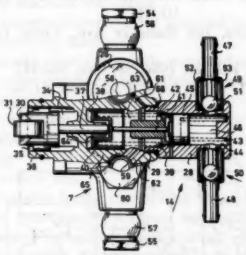
a secondary fuel circulation system including a booster pump for feeding said secondary system;

a housing of said booster pump having provided thereon a

threaded member adapted to be threadedly engaged with said threaded means in said end wall of said fuel pump for connecting said booster pump onto said fuel pump in operative association therewith;

said booster pump being thereby adapted to be interchangeably attached with a threaded plug adapted to engage said threaded means in sealing engagement;





said booster pump being constructed as a mechanical piston pump including a spring actuated piston which is adapted to be placed in operative connection with said piston of said fuel pump; and

a plunger provided in said booster pump protruding from said housing thereof for placing said piston of said booster pump in operative association with said piston of said fuel pump when said booster pump is connected with said fuel pump.

4,501,252

FUEL INJECTION PUMP

Gerhard Stumpp, Stuttgart; Hans-Jörg Vogtmann, Markgröningen; Paul Füssner, Sindelfingen; Manfred Schwarz, Gerlingen; Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg-Hoheneck; Max Straubel, Stuttgart, and Werner Faupel, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,638

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644042

Int. Cl.³ F02M *59/24*

U.S. Cl. 123—502 **2 Claims**

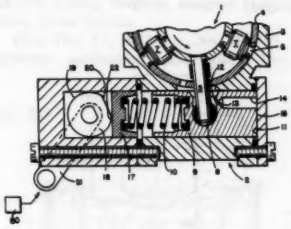
1. In a fuel injection pump for an internal combustion engine including: a housing; at least one pump piston in said housing; a cam drive arranged in the housing to produce the fuel feeding stroke of the at least one pump piston; at least one return spring; and an adjustable piston connected at one end to the at least one return spring and to the cam drive, said cam drive including a rotatable part, with said cam drive being rotatable relative to the direction of rotation of the rotatable part for adjusting the timing of the beginning of the fuel injection by means of the adjustable piston which is acted upon by an rpm dependent pressure produced by a feed pump against the force of the at least one return spring so that the tension of the at least one return spring can be varied after starting as a function of said rpm dependent pressure, the improvement comprising:

(a) a spring seat engaging the other end of the at least one return spring;

(b) adjusting means connected to the spring seat; and;

(c) control means connected to the adjusting means,

whereby the spring seat is shifted by the control means acting through rotation of the adjusting means to change the initial



tension of the at least one return spring at the earliest during engine warm-up and said adjusting means comprises a shaft having a longitudinal axis extending transversely to the direction of shifting of the spring seat, with said shaft having at least one roller cam means arranged eccentrically with respect to the longitudinal axis of the shaft and engageable with the spring seat, and wherein the spring seat is shifted by the roller cam means during rotation of said shaft.

4,501,253

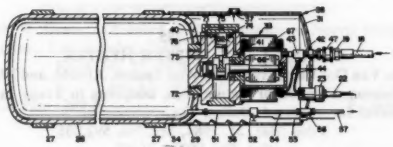
ON-BOARD AUTOMOTIVE METHANE COMPRESSOR

Joseph Gerstmann, Framingham, Mass.; William M. Hauck, Glenshaw, Pa.; Robert Raymond, Watertown, Mass., and Paul F. Swenson, Jr., Shaker Heights, Ohio, assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio

Filed Dec. 13, 1982, Ser. No. 449,483

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 **11 Claims**

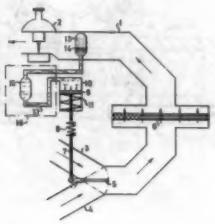


1. A vehicle, a combustion engine mounted on the vehicle, a drive train for directing power from the engine into propulsion of the vehicle, a pressure tank mounted on the vehicle for storing compressed gaseous fuel such as natural gas, means connecting the pressure tank to the combustion engine to enable the contents of the tank to be combusted as fuel by the engine, a compressor mounted on the vehicle in close proximity to the tank and having an inlet and an outlet, drive means for operating the compressor to compress gas supplied at its inlet at a relatively low pressure and to deliver it at its outlet at a relatively high pressure, the mounting and spatial relationship between the compressor and tank being arranged to permit the compressor to discharge at its outlet substantially directly into the tank in a manner such that the entire compressed gas flow path between the outlet of the compressor and the interior of the tank is shrouded by at least one of said compressor and tank components to thereby substantially eliminate the risk of high pressure gas, being delivered by the compressor to the tank, from leaking.

4,501,254
DEVICE FOR CONTROLLING THE TEMPERATURE OF THE INTAKE AIR TO AN INTERNAL COMBUSTION ENGINE

Michael Zellmer, Torslanda, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Nov. 18, 1983, Ser. No. 553,351
Claims priority, application Sweden, Dec. 3, 1982, 8206925
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—556 **4 Claims**

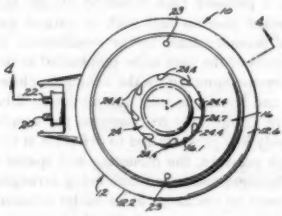


1. In an internal combustion engine with an air heater, a temperature-controlling air intake device comprising a damper, an inlet for cold air, an inlet for heated air, a mixed air duct, and an operating element in said mixed air duct controlling the setting of said damper between said cold and heated air inlets; the improvement in which said element comprises a fluid chamber comprising movable means controlling the damper setting depending on the volume of the chamber; a first expansion medium, a second expansion medium of lower coefficient of thermal expansion than the said first medium, a vessel located in the mixed air duct, said vessel containing said first expansion medium; a fluid conduit extending outside the mixed air duct and establishing communication between said vessel and said fluid chamber, said conduit containing said second expansion medium, said first and second expansion media being so disposed relative to each other that expansion and contraction of said first medium are transmitted by said second medium to said movable means, the relatively low coefficient of thermal expansion of said second medium reducing the influence on the position of the damper of temperature outside the mixed air duct.

4,501,255
DIESEL FUEL FILTER HEATER

Arie Van Der Ploeg, Wierden; Wim Jansen, Almelo, and Philips Gerson, Velp, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1984, Ser. No. 592,035
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **8 Claims**

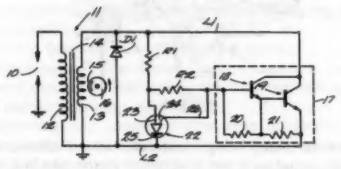


1. A heater for a diesel filter system comprising a housing means having a chamber with an inlet and an outlet for permitting diesel fuel to flow therethrough to a diesel fuel filter, thermally and electrically conducting plate means having self-regulating ceramic electrical resistance heater disc means of a material of positive temperature coefficient of resistivity secured in thermally and electrically conducting heat-transfer relation to the plate means, said plate means being mounted within the housing means at a location intermediate the inlet and outlet thereof so that the flow of diesel fuel through the chamber between the inlet and outlet normally passes the fuel directly over and around the plate means and the ceramic heater disc means in heat-transfer relation thereto, and electrically conducting means extending from the housing means for electrically connecting the electrical resistance heater disc means to a source of electrical power for energizing the heater disc means to heat the fuel, characterized in that the plate means comprises a plate having a flat plate portion and having baffle means upstanding from at least one side of the flat plate portion defining a plurality of side-by-side, spiral, fluid flow paths on the plate means to guide the flow of diesel fuel over substantial lengths of the plate means in heat-transfer relation thereto while permitting relatively free flow of such fuel over the plate means toward the chamber outlet.

4,501,256
SOLID STATE MAGNETO IGNITION SWITCHING DEVICE

Richard A. Dykstra, 169 Ramaker Ave., Cedar Grove, Wis. 53013

Filed Feb. 24, 1984, Ser. No. 583,447
Int. Cl.³ F02P *3/04, 9/00, 1/00, 11/00*
U.S. Cl. 123—651 **19 Claims**



1. An ignition control circuit for an internal combustion engine having a magnet for magnetically coupling with a stator in synchronism with engine rotation to induce current flow between first and second terminals of a primary winding on the stator followed by interruption of the current to thereby induce a high voltage in a secondary winding that is connected to a spark plug; said control circuit comprising:

a solid state switching device having its switching path connected in a circuit between said first and second terminals of the primary winding and having a control terminal to which a control voltage above a predetermined level is applied to switch said device to a conductive state,

a programmable unijunction transistor (PUT) having an anode, a cathode and a gate,

voltage determining means connected between said first primary winding terminal and said control terminal for developing a voltage and means for applying said voltage between the anode and gate of said PUT,

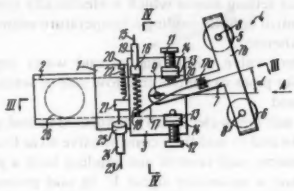
coupling of said magnet and stator causing voltage to be developed in said primary winding to thereby attain said predetermined voltage for switching said switching device to its conductive state whereby to increase current flow in said primary winding, and the concurrent increase in said PUT anode-to-gate voltage causing said PUT to conduct and remove said voltage from said control terminal to thereby switch said switching device to a nonconductive state whereby current flow through said primary winding is interrupted, and

diode means connected between said second and first primary winding terminals for conducting the reverse current in said winding.

4,501,257
ORIENTING ATTACHMENT TO BALL THROWING MACHINE

Boris G. Kholin, Sumy, U.S.S.R., assignor to Sumskoi Filial Kharkovskogo Politekhnicheskogo Instituta, Sumy, U.S.S.R.

Filed Jul. 14, 1982, Ser. No. 398,377
Int. Cl.³ F41D 11/00
U.S. Cl. 124—81 5 Claims



1. An orienting attachment for a ball throwing machine, comprising:

(a) a coupling unit for securing the attachment to said ball throwing machine, including

(i) a stationary sleeve rigidly attached to the barrel of a ball throwing machine;

(ii) a rotatable sleeve coaxially mounted on said stationary sleeve for rotation about the axis of said stationary sleeve;

(b) a ball deflector mounted on said movable sleeve and which may be rotated between two extreme positions, including

(i) two rollers and

(ii) a rotatable frame comprising two parallel T-shaped levers, each having a thrust leg and a head hingedly connected by said legs with said movable sleeve, and transverse spindles interconnecting said heads of said T-shaped levers and carrying said rollers mounted thereon so that they may be freely rotated,

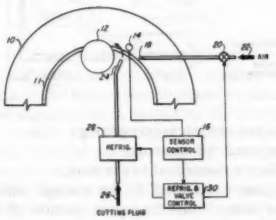
(c) stops secured to said movable sleeve for abutting against and restricting the rotation of said rotatable frame when said frame is set to one of two extreme positions, and

(d) at least one retainer on said movable sleeve for holding said frame in one of the extreme positions, connected with said movable sleeve and with the leg of one of said levers.

4,501,258
KERF LOSS REDUCTION IN INTERNAL DIAMETER SAWING

Lawrence D. Dyer, Richardson, and Anderson D. McGregor, Sherman, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 4, 1982, Ser. No. 432,508
Int. Cl.³ B28D 1/04; B24B 49/00
U.S. Cl. 125—13 R 5 Claims



1. A method for controlling the tension of an internal diameter saw blade while sawing an object, comprising the steps of:

directing a stream of fluid onto the cutting edge of said saw blade before said blade enters the object being sawed, wherein some of the fluid enters the cutting region;

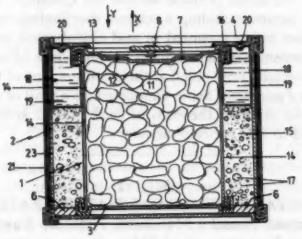
measuring the tension of said saw blade; and

regulating the fluid temperature responsive thereto.

4,501,259
DEVICE FOR HEATING FOOD CONTAINED IN A SEALED CONTAINER

Ramon Apellaniz, Lasne, Belgium, assignor to Tarahelm Limited, London, Great Britain

Filed Dec. 17, 1982, Ser. No. 450,695
Claims priority, application Luxembourg, Dec. 18, 1981, 83844
Int. Cl.³ F24J 1/00
U.S. Cl. 126—263 1 Claim

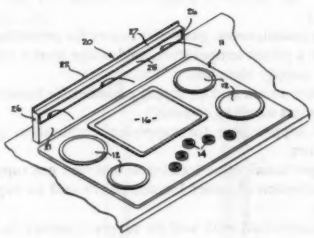


1. In a process for heating food contained in a sealed container surrounded by an envelope forming an outer chamber containing quicklime and water separated by a wall which can be easily pierced or torn, the improvement comprising reacting, after piercing said wall, grains of quicklime, the reactivity of which has been previously reduced by overburning at a termperature of 1100° to 1400° C., with an amount of water which is larger than the amount necessary for the hydration or slaking reaction of the quicklime, said amount of water being comprised between about 0.75 and 3 parts by weight for 1 part by weight of quicklime grains.

4,501,260
COOKTOP VENTILATION SYSTEM

William R. Grace, Alhambra, Calif., assignor to Norris Industries Inc., Los Angeles, Calif.

Filed Jul. 17, 1979, Ser. No. 58,322
Int. Cl.³ F24C 15/20
U.S. Cl. 126—299 R 5 Claims



1. In a cooktop having heating unit means, a venting system for venting fumes comprising:

a vent member having an air chamber and a snorkel member slidably mounted in said chamber, said snorkel member being formed from a pair of opposing sheets and side strips joining said sheets together along the edges thereof, a surface of one of said sheets facing towards said heating

unit means and a venting intake slot providing fluid communication to said chamber being formed along the top edge of said last-mentioned sheet, said intake slot being the only venting intake of said vent member, and venting exhaust means including a venting duct having an intake end connected to said chamber and an exhaust end and blower means mounted at said exhaust end of the duct for providing suction in said duct and said chamber,

a control switch, and

motor drive means responsive to actuation of said control switch for driving said snorkel member from a retracted position in the chamber to an extended position substantially normal to the surface of the cooktop with the venting intake slot at a level substantially above that of the heating unit means and responsive to a second actuation of said control switch for driving said snorkel member back to its retracted position within the chamber, said motor drive means including a scissors mechanism, said snorkel member being mounted in said chamber on said scissors mechanism, said mechanism having a pair of arms which are pivotally connected at their centers, one of the ends of each of said arms being supported on a wall of said chamber, the other of the ends of each of said arms being attached to said snorkel member.

4,501,261

INSTANTANEOUS GAS WATER HEATER

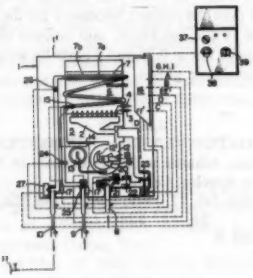
Osamu Tsutsui; Shusaku Murakami; Hidehiko Kuwahara, and Shigefumi Yasunaga, all of Shiga, Japan, assignors to Toto Limited, Fukuoka, Japan

Filed Jun. 27, 1983, Ser. No. 507,917

Claims priority, application Japan, Jun. 28, 1982, 57-112127; Mar. 14, 1983, 58-42617

Int. Cl.³ F24H *1/00*

U.S. Cl. 126—351 **15 Claims**



1. An instantaneous gas water heater for providing a flow of water at a preset temperature, said water heater comprising

an air supply chamber,

a burner within said air supply chamber for burning combustion gas supplied thereto,

a gas supply pipe for supplying combustion gas to said burner,

a proportional valve located within said gas supply pipe,

a combustion chamber located above said air supply chamber,

a fan associated with said air supply chamber for supplying primary and secondary air thereto for combustion,

a heat exchanger positioned in said combustion chamber, said heat exchanger having an input end and an outlet end,

a water input pipe connected to said input end of said heat exchanger for supplying cold water thereto,

a water outlet pipe connected to said outlet end of said heat exchanger for delivering hot water therefrom,

a control unit,

a water flow rate sensor located in said water inlet pipe which is electrically connected to said control unit for sending a water flow rate signal A thereto,

a water temperature sensor located in said water inlet pipe which is electrically connected to said control unit for sending a cold inlet water signal B thereto,

a water temperature sensor located in said water outlet pipe which is electrically connected to said control unit for sending a hot outlet water signal C thereto,

a temperature setting means which is electrically connected to said control unit for sending a temperature setting value signal T_s thereto,

a flow control valve within one of said water input and water outlet pipes to control the flow rate of water therethrough, and

said control unit being electrically connected to said proportional valve and to said flow control valve so as to control their operation, said control unit sending both a primary signal E and a secondary signal E' to said proportional valve, said primary signal E representing the value obtained by multiplying the signal A by the value achieved by subtracting signal B from signal T_2 and then dividing the result by the predetermined heat efficiency of the heat exchanger, and the secondary signal E' representing the value obtained by multiplying a predetermined proportional gain value α wherein α is one of a plurality of predetermined values with different temperatures associated with Ts with the value obtained by subtracting signal C from signal T_s; said control unit controlling the opening of said flow control valve so as to assure that the temperature of the water flowing through the water outlet pipe is essentially equal to T_s.

4,501,262

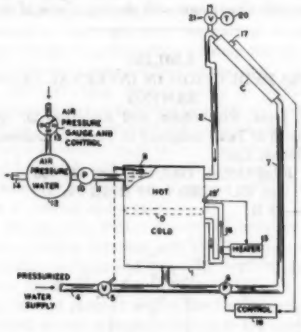
SOLAR HOT WATER SYSTEM WITHOUT HEAT EXCHANGER

Floyd A. Lyon, Brookville, N.Y., assignor to Halm Instrument Co. Inc.

Filed Apr. 14, 1980, Ser. No. 139,832

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—437 **2 Claims**



1. Solar hot water system comprising:

a non-pressurized storage tank,

a solar collector connected to the tank,

a heater means connected to the storage tank, means to withdraw water from the upper portion of the storage tank to provide a pressurized hot water supply,

a vertically moveable insulated divider in the storage tank to separate hot and cold water in the storage tank,

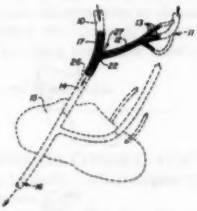
the divider being weighted to float on water of pre-determined temperature and density.

4,501,263

METHOD FOR REDUCING HYPERTENSION OF A LIVER

Stanley C. Harbuck, P.O. Box 1643, Salt Lake City, Utah 84110

Filed Mar. 31, 1982, Ser. No. 364,139
Int. Cl.³ A61B 19/00; A61F 1/00
U.S. Cl. 128—1 R 2 Claims



1. A method for reducing hypertension of a liver having a hepatic artery, comprising:

ligating the hepatic artery into the liver;

diverting the blood from the hepatic artery proximal of the liver by means of an arterial conduit formed of polymer fabric to a portal vein conduit formed of a polymer fabric;

joining flow through the arterial conduit to flow through the portal vein conduit at a junction formed of polymer fabric;

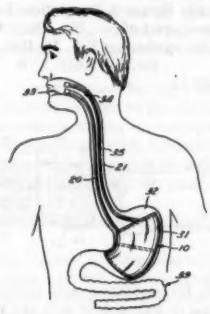
discharging said joined arterial blood flow and portal vein blood flow proximal of the liver, said portal vein conduit being inserted in said portal vein proximal of the liver, thereby to reduce blood pressure in the liver.

4,501,264

MEDICAL SLEEVE

Arthur G. Rockey, 3438 Sharon Rd., Charlotte, N.C. 28211

Continuation of Ser. No. 912,010, Jun. 2, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 216,989
Int. Cl.³ A61B 17/00
U.S. Cl. 128—1 R 4 Claims



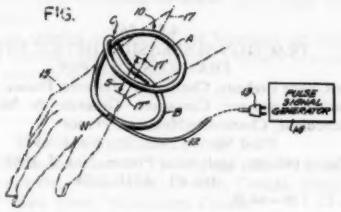
1. A method of controlling obesity, comprising the steps of positioning a sleeve impervious to digestive juices and normal foods in the digestive tract, arranging the sleeve in the digestive tract in such a manner that substantially all normally ingested food material passing naturally through the oral cavity and then passing through the digestive tract is caused to pass through the sleeve while being isolated from direct contact with the surrounding area of the interior walls of the digestive tract and body fluids secreted by such surrounding area interior walls such that natural absorption of food material in the digestive tract is impaired and a net caloric intake for a given quantity of ingested food is thereby reduced, said sleeve being disposed substantially entirely in the stomach.

4,501,265

APPLICATOR HEAD FOR ELECTROMAGNETIC TREATMENT OF AN AFFLICTED BODY REGION

Eugene A. Pescatore, Elmwood Park, N.J., assignor to Electro-Biology, Inc., Fairfield, N.J.

Filed Dec. 23, 1982, Ser. No. 452,421
Int. Cl.³ A61N 1/40
U.S. Cl. 128—1.5 10 Claims



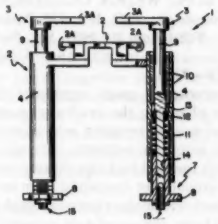
1. An electromagnetic body-treatment device for surgically non-invasive modification of the growth, repair and maintenance behavior of living tissues and cells by a specific and selective change in electrical environment, comprising a single multi-turn electrical coil of initially generally circular configuration, said coil having a flexible external lead-cable connection and said coil being deformed into a body-adapting retaining figure-eight configuration to thus define two loops with a generally central crossover integrally connecting said loops, the generally central crossover region being generally arcuately bent to provide a relatively rigid positioner of said two loops in spaced substantially parallel planes wherein the effective local diameter of each of said loops substantially equals or exceeds the effective spacing between said planes, said loops being about a single axis of flux development that is substantially normal to said planes, and means connected to said cable connection for electrically exciting said single coil with a succession of low-voltage unidirectional asymmetrical pulses; whereby, upon insertion of an afflicted body region in the space between said loops, said smaller loops coact in flux-aiding fashion to establish substantially uniform flux distribution in the afflicted body region.

4,501,266

KNEE DISTRACTION DEVICE

John McDaniel, Warsaw, Ind., assignor to Biomet, Inc., Warsaw, Ind.

Filed Mar. 4, 1983, Ser. No. 472,160
Int. Cl.³ A61F 5/00; A61B 17/00, 17/18
U.S. Cl. 128—69 13 Claims



1. A knee distraction device for facilitating knee arthroplasty comprising

a tibia-engaging member engageable with a resected tibial plateau of a patient,

a condyle-engaging member engageable with a distal femoral condyle of the patient,

force-applying means for forcibly moving said tibia- and condyle-engaging members relative to one another to tension the patient's ligaments,

and adjustable force calibration means operatively connected with the force-applying means for calibrating the degree of ligament tension applied by the distraction device.

4,501,267

TRACTION-SUSPENSION DEVICE WITH TRANSOSSEOUS PIN

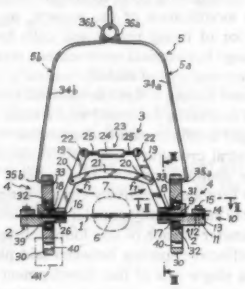
Jean-Claude Pecheux, Charleville-Mezieres, France, assignor to Societe Anonyme: Compagnie Generale de Materiel Orthopedique, Charleville-Mezieres, France

Filed Nov. 3, 1982, Ser. No. 438,929

Claims priority, application France, Nov. 5, 1981, 81 20897

Int. Cl.³ A61F 5/04

U.S. Cl. 128—84 R **8 Claims**



1. Traction-suspension device with transosseous pin, of the type comprising a pin designed to go through a bone and of which the end portions can be subjected to a traction, one with respect to the other, by means of an adjustable tension rod, wherein said device comprises:

a tensioning pin and tension sleeves immobilizable in adjustable axial position on the pin,

two support bearings receiving the said sleeves via ball bearings,

a traction-suspension hoop adaptable on the bearings,

a tensioning stirrup adaptable between the bearings on assembling endpieces formed by the sleeves in facing relation.

4,501,268

BONE WEDGE GUIDANCE SYSTEM

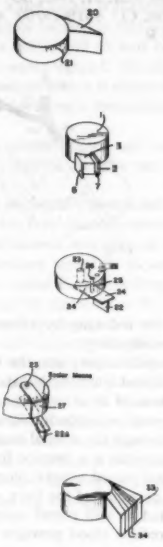
John E. Comparetto, P.O. Box 433, Nassawadox, Va. 23413

Filed Aug. 20, 1981, Ser. No. 294,653

Int. Cl.³ A61F 5/04

U.S. Cl. 128—92 E **20 Claims**

1. An osteotomy guide apparatus for use in a surgical method for changing the axial alignment of a bone having a longitudinal axis by severing said bone and healingly repositioning the resulting segments thereof with respect to each other, which method includes cutting across a portion of said bone in an arcuate cut extending from and through one side of said bone and terminating between said side and the opposed side of said bone, the arc of said arcuate cut being a portion of a circle which has its center offset from said longitudinal axis; and cutting two non-radially extending, circumferentially spaced cuts from said arcuate cut to and through the opposed side of said bone to form a removable wedge so that the severed bone segments can be rotated about said arcuate cut to effect said repositioning when said wedge is removed; said osteotomy guide apparatus comprising: a crecentric curvilinear body having a curvilinear edge extending therefrom for inserting in a crecentric osteotomy cut in a bone, and having a



tab planar cut guide means extending outward from the curvilinear body at an angle to the curvilinear body other than normal to a tangent to the body at the intersection of the tab planar cut guide means and the body.

4,501,269

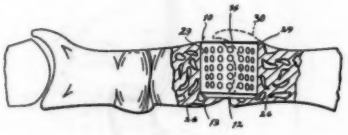
PROCESS FOR FUSING BONE JOINTS

George W. Bagby, Spokane, Wash., assignor to Washington State University Research Foundation, Inc., Pullman, Wash.

Continuation-in-part of Ser. No. 330,169, Dec. 11, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,841

Int. Cl.³ A61F 5/04

U.S. Cl. 128—92 G **3 Claims**



1. A process for stabilizing and promoting bone-to-bone fusion of a human or animal joint such as a spinal joint between adjacent vertebrae or the ankle joint formed by opposed contiguous bony surfaces which are covered and separated by intervening cartilage and are surrounded by ligaments which resist expansion of the joint; comprising the following steps:

surgically accessing the joint;

removing intervening cartilage located between the contiguous bony surfaces;

boring across the contiguous bony surfaces a transverse cylindrical opening having a selected inside diameter about opposed semi-cylindrical surface areas formed across the respective bony surfaces;

retaining the fresh autogenous bone fragments produced by the boring step;

driving into the transverse cylindrical opening a hollow

basket having a rigid perforated cylindrical wall whose outside diameter is slightly greater than the inside diameter of the cylindrical opening to immediately stabilize the joint by spreading the bony surfaces apart in opposition to the resistance to expansion of the joint provided by the surrounding ligaments;

filling said hollow basket with fresh autogenous bone fragments produced by the boring step, thereby omitting the need for a second surgical site, to promote bone ingrowth about the basket and through its perforated cylindrical wall while providing immediate stabilization of the joint; and

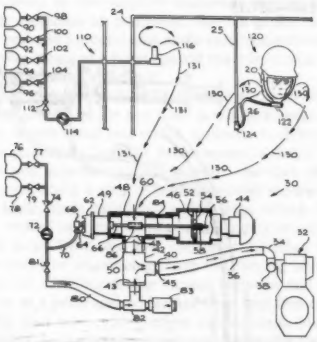
closing the access to the joint.

4,501,270

BREATHING AIR CONSERVATION SYSTEM

Gary J. Ulinskas, La Jolla, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 27, 1982, Ser. No. 437,187
Int. Cl.³ A62B 7/00
U.S. Cl. 128—202.13 **19 Claims**



15. A combination system for an enclosed survival capsule for supplying air during a restricted air intake mode to the occupants in the cabin of the capsule and air for an engine constituting the propulsion means of the capsule, said system comprising:

(1) an air intake control system having a housing including an air intake passage adapted to be coupled to the engine air intake, said housing having an intake port adapted to be located in communication with the cabin atmosphere to provide air to the engine to enable the engine to operate in a normal air intake mode, said air intake control system further including:

(a) pressure responsive means for closing said air intake port;

(b) a first orifice in said housing adapted to be located in communication with said cabin atmosphere and downstream from the closing means for admitting air into the air intake passage from the cabin and bypassing the air intake port; and

(c) means for supplying air from a compressed air source to the air intake passage and including a restrictor means in series with the air supplying means for limiting the air provided from the compressed air source to said intake air passage, said first orifice and restrictor means being respectively sized to provide about 35% of the air to the engine through the first orifice from the cabin and about 65% of the air to the engine from the compressed air source when the engine is operating in the restricted air intake mode said pressure responsive means closing said air intake port in response to air supplied to said air intake passage from said compressed air source said compressed air source; and

(2) a breathing air supply system adapted to be mounted in said capsule including:

(a) a compressed air supply;

(b) a breathing air manifold connected to said compressed air supply and having a plurality of breathing masks selectively connected thereto; and

(c) a main valve and a regulator connected in series between the compressed air supply and the manifold, the regulator being set to provide a flow rate corresponding to the 35% of engine air drawn in through the first orifice;

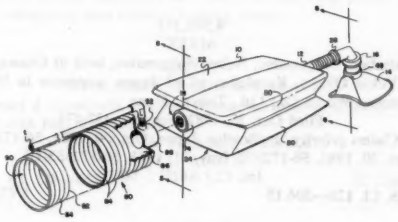
whereby air exhaled by users of the breathing air system is exhausted into the cabin and is thereby available to supply air admitted through the first orifice.

4,501,271

RESUSCITATOR

John T. Clifton, Bowmanville, Canada, and John W. Spear, 2686 Thornlodge Dr., Mississauga, Ontario, Canada, assignors to John William Spear, Mississauga, Canada

Filed Oct. 13, 1981, Ser. No. 310,731
Int. Cl.³ A61M 16/00
U.S. Cl. 128—205.13 **9 Claims**



6. A resuscitator for use with a breathing device such as a mask, tube or the like comprising;

an air bag having fresh air inlet means for admitting fresh air to the interior of the bag and having air outlet means and operable to pump air through said outlet means;

a two-way valve chamber having a supply end and a mask end, the mask end being adapted for communication with a breathing device, both said ends having opening means, the supply end opening being connectible with said air outlet means of said bag, and adapted to receive air from said bag;

a first valve plate member of thin lightweight material of predetermined shape and size freely movable within said valve chamber between said supply end and said mask end for closing respective said opening means, the first valve plate member defining a flow axis and a single generally circular opening centered on the flow axis and being otherwise imperforate;

a plurality of support arms formed integrally with the first plate member extending radially inwardly from the perimeter of the circular opening, the support arms defining and being integrally joined together at a solid central hub at the center of said circular opening, whereby the support arms divide said generally circular opening;

a plurality of stub members formed integrally with the first plate member extending radially inwardly from the perimeter of the circular opening and terminating short of said central hub;

said support arms and said stub members of said first valve plate member lying in a common plane whereby to define a flat planar valve surface;

a fastening boss formed integrally with the central hub of said first plate member and extending towards said mask end of said chamber;

retaining flange means formed integrally with said boss and spaced from said valve surface a predetermined distance;

a flat planar flexible valve element membrane attached to said first valve plate member, said member having a single central opening and being otherwise imperforate and fitting elastically over said boss and fitting within said predetermined spacing between such first valve plate member and such flange means engaging such valve element membrane and retaining same in position lying flat on said flat planar valve surface; said valve element membrane normally closing said generally circular opening and being flexibly movable so as to open said generally circular opening when air flows from said supply end opening means of said chamber to said mask end opening means, and,

a second valve plate member integrally formed with support arms, a central hub, stub members, fastening boss, and flange means all being generally identical to the first valve plate member and corresponding support arms, central hub, stub members, fastening boss, and flange means, the second valve plate member having a flat planar flexible valve element membrane attached thereto generally identical to the membrane attached to the first valve plate member, the second valve plate member forming part of the air inlet means whereby to permit air flow through the inlet means into the air bag and to prevent flow out of the bag.

4,501,272

MASK

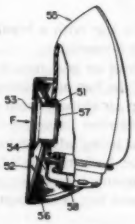
Kaisaburo Shigematsu; Nobuo Shigematsu, both of Urawa, and Yukio Okubo, Kasukabe, all of Japan, assignors to Shigematsu Works Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,474

Claims priority, application Japan, Oct. 30, 1981, 56-172871; Oct. 30, 1981, 56-172870; Nov. 21, 1981, 56-172653[U]

Int. Cl.³ A62B 7/00

U.S. Cl. 128—206.15 **5 Claims**



1. An intake chamber assembly for a mask comprising a front wall and a rear wall arranged to form an intake chamber therebetween, said front wall and rear wall each having a peripheral edge portion and said peripheral edge portions are hermetically joined together, said front wall is formed of a non-permeable plate-like material, said rear wall is formed of a filtration medium, said rear wall having a hole extending therethrough opening into said intake chamber, an intake cylinder fitted into the hole in said rear wall and hermetically connected to said rear wall, said intake cylinder forming an opening having one end communicating with said intake chamber and an opposite end adapted to be connected to said mask, said front wall disposed in spaced relation to the opening in said intake cylinder communicating with said intake chamber, connecting pieces extending between and connecting said front wall and said intake cylinder for maintaining the spaced relation between said front wall and said intake cylinder, a closing body located within said intake chamber opposite the opening in said intake cylinder communicating with said intake chamber, means for supporting body on said front wall within said intake chamber such that it has a first position spaced from the opening in said intake chamber and a second position where it closes the opening in said intake chamber and into which said second position it is displaceable from the first position by the depressing force of a finger so that when the depressing force is released said closing body returns automatically to the first position.

4,501,273

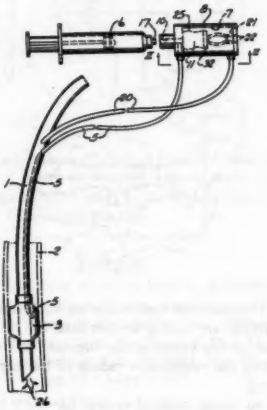
ENDOTRACHEAL TUBE WITH PRESSURE CONTROLLED INFLATABLE CUFF

Gerald E. McGinnis, 131 Kelvington Dr., Monroeville, Pa. 15146

Filed Sep. 30, 1982, Ser. No. 432,067

Int. Cl.³ A61M 25/00

U.S. Cl. 128—207.15 **4 Claims**

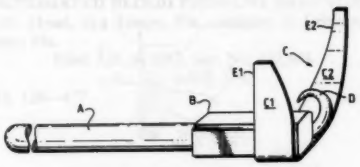


1. In combination, an endotracheal tube having distal and proximal ends, a normally collapsed flexible tubular cuff encircling the tube near its distal end and having opposite ends sealed thereto, a tubule extending from the cuff outwardly along said tube and having a distal end communicating with the inside of the cuff, the proximal end of the tubule having an inlet for air under pressure for inflating the cuff, an inflatable member, the tubule inlet fluidically communicating with the interior of the inflatable member, a valve housing provided with an air inlet bore fluidically communicating with the tubule inlet and interior of the inflatable member, valve means in the bore normally closing the inlet thereof, means for opening the valve means to admit air under pressure through said inlet bore to inflate the cuff and the inflatable member, the improvement comprising, said inflatable member mounted within said valve housing for expansion and contraction therein and including constant pressure means disposed in said valve housing between said inflatable member and said valve housing for exerting a substantially constant bias against said inflatable member throughout a predetermined range of expansion of said inflatable member in said valve housing whereby air inflation pressures within said inflatable member and said cuff are maintained substantially constant even though their respective inflation volumes may vary.

4,501,274
MICROSURGICAL INSTRUMENT

Finn Skjaerpe, Nedrevelen 1, Stavanger, Norway (N-4000)

PCT No. PCT/NO82/00014, § 371 Date Oct. 29, 1982, § 102(e) Date Oct. 29, 1982, PCT Pub. No. WO82/03168, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 12, 1982, Ser. No. 438,891
Claims priority, application Norway, Mar. 12, 1981, 810849
Int. Cl.³ A61B 17/32
U.S. Cl. 128—305 13 Claims



1. A microsurgical instrument for performing selective trabeculectomy in the surgical treatment of glaucoma, said instrument including an elongated, flexible probe means having a first end and a second end, and a cutting member attached to said probe means at a point spaced apart from said first end, said cutting member including

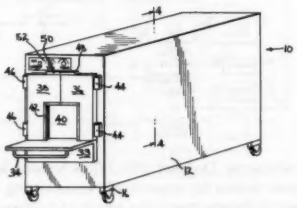
two knife blades which are separated so as to fit into the scleral groove of the eye wall in which trabecular meshwork is embedded and which protrude in different transverse directions from the probe means in order to extend from said groove into the anterior chamber of the eye, thus embracing a strip of said trabecular meshwork, each said knife blade providing a first edge which faces said first end of said probe means and a second edge which faces away from said first end of said cutting means, at least said first edge being sharp for cutting, and

at least one catching device located between said two knife blades at a point spaced farther from said first end of said probe than said cutting edges of said knife blades, each catching device retaining thereon trabecular tissue which has been cut by said knife blades.

4,501,275
MAMMALIAN SUBJECT HEATING UNIT USING RADIANT HEAT

Jerry D. Maahs, 19230 Glen Kerry Dr., Brookfield, Wis. 53005

Filed Jul. 6, 1981, Ser. No. 280,999
Int. Cl.³ A61F 7/00
U.S. Cl. 128—402 23 Claims



1. Whole body hyperthermia apparatus capable of providing hyperthermic core temperature conditions in live mammalian subjects while minimizing risk to the subject comprising:

a wall member and a pair of end walls defining a closed cavity suitable for receiving the body of the subject with the head and neck of the subject extending through an opening in one of said end walls outside the closed cavity, said one end wall having closure means at said opening for providing a substantially air tight seal at said opening about the neck of the subject to prevent air circulation to and from said cavity, said wall member extending completely around the body of the subject when received therein, said wall member being formed of a material capable of radiating heat and having a radiant heat enhancing emissivity;

means for positioning the body of the subject in a generally central position in the cavity;

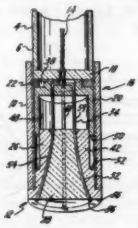
electric heating means mounted on the exterior of said wall member generating a heat input to the wall member for providing a sufficient quantity of radiant heat from the wall member directly to the body of the subject to increase the core temperature of the subject by radiant heating by a physiologically significant amount in a desired period of time, said wall member and heating means providing such radiant heat generally uniformly over the entire area of the wall member to minimize convection air currents in said cavity and at a power density low enough to limit the temperature of the air near said wall member at approximately 65° C. and the skin temperature of the subject at approximately 42.5° C. while achieving a hyperthermic condition of approximately 41.8° C. as measured rectally in the subject; and

circuit means connected to a source of electrical power for energizing said electric heating means.

4,501,276
FETAL ELECTRODE APPARATUS

Edward J. Lombardi, Malden, Mass., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 16, 1982, Ser. No. 399,073
Int. Cl.³ A61B 5/04
U.S. Cl. 128—642 52 Claims



1. An apparatus for use in monitoring fetal vital signs with monitoring equipment, insertable through the vagina and the cervix of a woman in labor into a fetal scalp, comprising:

(a) a form-sustaining guide tube having a forward end portion and adapted to be inserted through the vagina and cervix of the woman in labor;

(b) a sleeve having a forward end portion, the sleeve being disposed about the forward end portion of the guide tube, and the sleeve being configured to allow slideable movement of the forward end portion of the guide tube within the sleeve;

(c) a piston member slideably disposed within the sleeve for releasably engaging the forward end portion of the guide tube;

(d) a body member including:

(i) a rearward portion releasably disposed within the sleeve adjacent the piston member;

(ii) a forward portion having a shoulder releasably engaging the forward end portion of the sleeve and configured to preclude the forward portion of the body member from moving within the sleeve along the longitudinal axis of the sleeve toward the piston member by more than a predetermined distance, said forward portion of

the body member effecting releasable contact with the fetal scalp; and

(iii) at least two channels passing from the rearward portion of the body member and advancing outwardly along the longitudinal axis of the sleeve through the forward portion of the body member, said channels defining continuous open passages through the body member;

(e) at least two resilient active electrode members mounted on the piston member and having a free end slideably disposed within the channels, said active electrode members being of sufficient length for the free ends to pass through the channels and advance into the fetal scalp as the guide tube engages the piston member and causes the active electrodes to advance along the channels and out of the forward portion of the body member; and

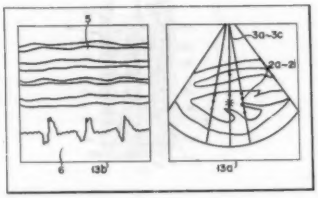
(f) means for electrically connecting the active electrode members to the monitoring equipment.

4,501,277

SELECTED BEAM MARKING SYSTEM FOR RAPID ULTRASOUND MEASUREMENTS

Hironobu Hongo, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1982, Ser. No. 426,133
Claims priority, application Japan, Nov. 12, 1981, 56-180382
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **8 Claims**



1. An ultrasonic pulse Doppler apparatus comprising:

an ultrasonic probe for transmitting ultrasonic beam into an object and receiving the echoes from said object;

a first processing means for processing the echoes received by said probe to form data of a B scan tomogram of said object;

a first display means for displaying the B scan tomogram;

beam mark setting means for setting at least one beam mark on the displayed B scan tomogram;

measuring point presetting the positions of means for a plurality of blood flow measuring points on said beam mark;

measuring point selecting means for selecting any one blood flow measuring point from said plurality of blood flow measuring points;

a second processing means for processing the echoes received by said probe to form a signal of a blood flow velocity at a selected measuring point;

a second display means for displaying the blood flow velocity at the selected measuring point; and

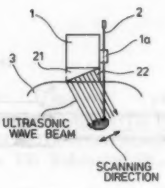
modulating means for distinguishing the selected measuring point on said displayed beam mark from other measuring points on said beam mark.

4,501,278

ULTRASONIC PROBE FOR PUNCTURE TREATMENT

Keiki Yamaguchi, and Shinichi Sano, both of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Continuation of Ser. No. 344,361, Feb. 1, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,356
Claims priority, application Japan, Feb. 9, 1981, 56-16942
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—660 **5 Claims**



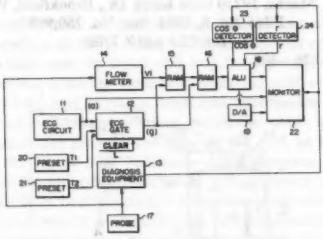
1. An ultrasonic diagnosis and/or treatment device comprising a needle, a guide member means for holding said needle; and a linear scanning probe means for generating ultrasonic waves; wherein said needle, said guide member means and said probe means are cooperatively arranged so that said needle can be driven perpendicularly to and into the surface of and into a patient's body, while concurrently a plurality of parallel ultrasonic waves emitted from said probe means are, in a linear scan, incident upon said needle, all at the same oblique angle within said patient's body and concurrently incident upon a desired part of said patient's body, whereby said needle is guided directly and accurately to said desired part of said patient's body.

4,501,279

ULTRASONIC BLOOD FLOW SENSING APPARATUS

Yasutsugu Seo, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 14, 1982, Ser. No. 418,001
Claims priority, application Japan, Sep. 18, 1981, 56-146311
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—663 **7 Claims**



1. An ultrasonic Doppler blood flow sensing apparatus:

transducer means for sequentially transmitting a plurality of ultrasonic beams towards a vessel of a subject and receiving echoes of said beams reflected from said vessel;

Doppler flow measuring means for analyzing said echoes to obtain an instantaneous velocity of blood in said vessel with every beam, a radius of said vessel and an angle between the said ultrasonic beam and said vessel;

ECG means for providing an electrocardiographic signal indicating an ECG cycle of said subject; and

processing means for: (1) integrating said instantaneous velocity over a predetermined portion of a predetermined

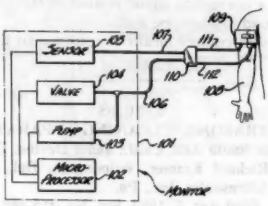
number of said ECG cycles and providing a blood flow quantity related thereto, (2) averaging said integrated velocity over the most recently occurring said predetermined number of said ECG cycles to produce an average blood flow quantity and (3) updating said integrating and averaging each of said ECG cycles to produce said average blood flow quantity that is constantly current.

4,501,280

AUTOMATIC IDENTIFICATION OF CUFF SIZE IN AUTOMATED BLOOD PRESSURE MONITORS

Rush W. Hood, Jr., Tampa, Fla., assignor to Critikon, Inc., Tampa, Fla.

Filed Apr. 6, 1983, Ser. No. 482,664
Int. Cl.³ A61B 5/02
U.S. Cl. 128—677 **3 Claims**



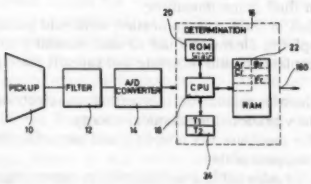
1. In an automatic blood pressure monitoring system for monitoring both neonatal and adult patients with a single monitor, a method of automatically detecting use of a neonatal cuff comprising the steps of:
(a) inflating said cuff to a predetermined pressure;
(b) coupling an acoustic pulse from said monitor to said cuff;
(c) detecting return of said acoustic pulse to said monitor from said cuff;
(d) measuring the time duration of propagation of said pulse;
(e) comparing said measured duration with a predetermined reference threshold; and
(f) commencing neonatal monitoring if said measured duration has a predetermined relationship with said threshold.

4,501,281

ELECTRONIC SPHYGMOMANOMETER

Toshio Furukawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1982, Ser. No. 450,042
Claims priority, application Japan, Dec. 18, 1981, 56-205739
Int. Cl.³ A61B 5/02
U.S. Cl. 128—680 **4 Claims**



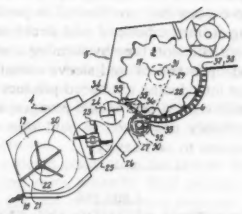
1. An electronic sphygmomanometer comprising:
sensor means for detecting sounds or vibrations generated from an artery and for producing an analog output signal;
analog-to-digital converter means for converting said analog output signal developed from said sensor means into a digital signal; and
Korotkoff sounds recognition means for analyzing the waveform of said analog signal including:
monitoring means for introducing said digital signal developed from said analog-to-digital converter means to said Korotkoff sounds recognition means within a preselected time interval;
detection means for detecting positive and negative peaks in said digital signal introduced by said monitoring means;
first determination means for determining whether adjacent positive and negative peaks detected by said detection means have a level difference greater than a preselected difference; and
second determination means for determining whether said adjacent positive and negative peaks are detected by said detection means within a predetermined period of time.

4,501,282

COMBINE HARVESTER CROP IN-FEED CONVEYOR

Jean Claude Muller, Verrieres le Buisson, and James B. McNaught, Wasquehal, both of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

PCT No. PCT/GB81/00258, § 371 Date Aug. 2, 1982, § 102(e) Date Aug. 2, 1982, PCT Pub. No. WO82/01805, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 25, 1981, Ser. No. 403,743
Claims priority, application United Kingdom, Dec. 6, 1980, 8039224
Int. Cl.³ A01F 12/10
U.S. Cl. 130—27 P **10 Claims**



1. A combine harvester of the type having a crop elevator that feeds crop upwards across a crop floor to a rotary threshing cylinder arranged transversely of the direction of advance of the combine in work and adjacent a threshing concave so as to thresh crop fed tangentially between the cylinder and concave characterized in that a driven crop conveyor (**27**) is provided along the front edge of the concave (**6**) between the concave (**6**) and the upper end of the elevator crop floor (**25**) so as to form a substantially continuous crop floor surface with said floor (**25**) and concave (**6**) over which the crop passes, and a changeable speed drive mechanism (**28, 29, 30, 33**) is provided to drive the crop conveyor (**27**) and allow its speed to be changed so as to control the speed of crop flow to the threshing cylinder (**3**).

4,501,283

PLUG LOADER

James W. Webb, 2203 Grant Ave., Redondo Beach, Calif. 90278

Filed Sep. 28, 1982, Ser. No. 425,225
Int. Cl.³ A24F 23/00
U.S. Cl. 131—329 **1 Claim**

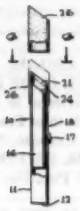
1. A plug loader for withdrawing a quantity of tobacco from a bulk supply and delivering the tobacco to the mouth of the user comprising the combination of:
an elongated hollow sleeve of oblong transverse cross-section having front and back walls and being open at a forward end and closed at its opposite end;
a plunger of oblong transverse cross-section having a closed end facing said sleeve open end slidably disposed in said

sleeve for moving between said open and said closed ends and substantially occupying the hollow of said sleeve;

means cooperatively carried between said sleeve and said plunger for limiting movement of said plunger so as to establish a cavity of predetermined volume defined between said closed end of said plunger and said sleeve open end;

said plunger and said sleeve have concentric semi-circular arcuate cross-sections so that said predetermined volume cavity is of a similar arcuate defined configuration;

said limiting means comprise a slot in the side of said sleeve and a pin carried on said plunger projecting through said



slot adapted to selectively engage with the opposite ends of said sleeve slot to restrict movement of said plunger;

indicia carried on said sleeve adjacent to said slot cooperating with said plunger pin to indicate the size of said cavity;

said plunger closed end and sleeve open end associated at said sleeve open end are slanted in parallel relationship extending from the back of said sleeve to the front provided with said slot, thereby forming a wedge shape;

said slanted open end of said sleeve constituting a cutting means for introducing a tobacco product into said cavity against said slanted end of said plunger; and

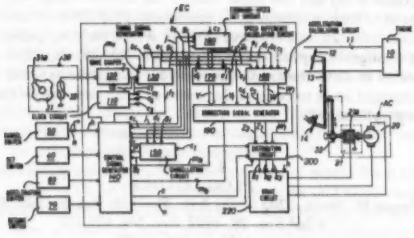
a cap detachably connected to said sleeve open end for closing access to said cavity.

4,501,284

SPEED CONTROL METHOD AND SYSTEM FOR AUTOMOTIVE VEHICLES

Akira Kuno, Oobu, and Yoshio Shinoda, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 20, 1982, Ser. No. 435,603
Claims priority, application Japan, Oct. 21, 1981, 56-168314
Int. Cl.³ F02D *29/02*
U.S. Cl. 123—352 **8 Claims**



1. A speed control method for an automotive vehicle driven by an internal combustion engine under control of control means for controlling the quantity of fuel supplied into said engine to maintain the actual speed of the vehicle to a desired value, the speed control method comprising the steps of:

producing a speed signal with a frequency responsive to the actual vehicle speed;

producing a series of clock signals at a constant frequency;

producing a command signal indicative of the desired vehicle speed;

determining a divisional frequency ratio inversely proportional to a value corresponding with the desired vehicle speed and dividing the actual frequency of the speed signal by the divisional frequency ratio to produce a timing signal with the divided frequency;

calculating a first difference between values of the command and speed signals in accordance with the clock signals defined by a period of time of the timing signal and producing a first difference signal indicative of the calculated first difference;

calculating a second difference between values of the successive speed signals in accordance with the clock signals defined by each period of time of the successive timing signals and producing a second difference signal indicative of the calculated second difference;

producing, responsive to the first and second difference signals, a correction signal related to the calculated first and second differences; and

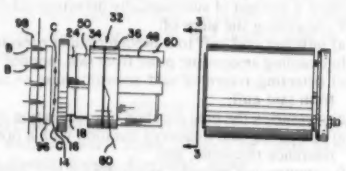
actuating said control means in response to the correction signal.

4,501,285

ULTRASONIC CLEANING APPARATUS

Charles Irwin, Santa Ana, Calif.; Janet Devine, Downingtown, Pa., and Richard Kramer, Wilmington, Del., assignors to Sonobond Ultrasonics, Inc., Pa.

Filed Apr. 5, 1982, Ser. No. 365,569
Int. Cl.³ B08B *3/12*
U.S. Cl. 134—58 R **7 Claims**



1. An ultrasonic transducer for cleaning applications, comprising:

a. a support plate including a passageway therethrough proximate the central portion thereof;

b. a faceplate including a cleansing surface and a passageway therethrough exiting centrally of said cleansing surface;

wherein said support plate passageway and said faceplate passageway communicate and said support plate facingly contacts said faceplate to support same;

c. means for releaseably retaining said faceplate in integral facing contact with said support plate with said passageways in fluid communication;

d. a conduit in fluid communication with said passageways for supplying cleansing fluid to said cleansing surface of said faceplate via said faceplate and support plate passageways;

e. piezoelectric means for converting an electrical input signal to vibrational mechanical energy;

f. means for mechanically coupling said piezoelectric means to said support plate;

g. means for adjustably mechanically compressing said piezoelectric means within a preselected pressure range;

h. sensor means for measuring amplitude of vibration of said piezoelectric means;

i. means for supplying said electrical input signal to said piezoelectric means; and

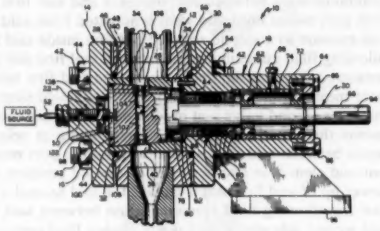
j. feedback circuit means, receiving from said sensor means a signal indicative of amplitude of vibration of said transducer, for regulating amplitude of signal input to said piezoelectric means by said signal supplying means.

4,501,286

ROTARY VALVE

Raymond G. Rohlfing, and Laura A. Martin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1983, Ser. No. 459,298
Int. Cl.³ F16K 5/22; B08B 3/04
U.S. Cl. 137—15 23 Claims



1. A valve for controlling the passage of material therethrough, comprising:

valve body means defining a valve chamber having a frustoconically shaped bearing surface and having an inlet port and an outlet port, each of said ports communicating between said valve chamber and the exterior of said valve body means;

valve member means for controlling the passage of material through said valve body means, said valve member means having a frustoconically shaped outer surface and first and second opposite ends, said valve member means being disposed within said valve chamber and being sized and shaped to be closely received within said valve chamber with its frustoconically shaped outer surface in slidable sealing engagement with the frustoconically shaped bearing surface of said valve chamber, said valve member being adapted to rotate about its longitudinal axis within said valve chamber;

drive means drivingly secured to the first end of said valve member means for rotating said valve member means about its longitudinal axis within said valve chamber;

biasing means carried by said valve body means for applying force to the opposite second end of said valve member means to urge the frustoconically shaped outer surface of said valve member means into slidable sealing engagement with the frustoconically shaped bearing surface of said valve chamber;

passage means in said valve body means communicating between said valve chamber and the exterior of said valve body means with said biasing means interposed in said passage means; and

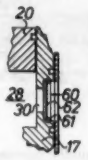
means in fluid flow communication between said passage means and a source of circulating flushing fluid whereby the fluid from said source flows through said passage means via said biasing means into said valve chamber so as to prevent the entrance of foreign matter into and the accumulation of foreign matter in said valve chamber and said biasing means.

4,501,287

BREAKAWAY COUPLING

John G. Thomson, Nottingham, England, assignor to Gall Thomson Maritime Limited, London, England

PCT No. PCT/GB81/00007, § 371 Date Feb. 11, 1982, § 102(e) Date Feb. 11, 1982, PCT Pub. No. WO81/03690, PCT Pub. Date Dec. 24, 1981
PCT Filed Jan. 17, 1981, Ser. No. 348,061
Claims priority, application United Kingdom, Jun. 16, 1980, 8019613
Int. Cl.³ F16K 13/04; F16L 35/00
U.S. Cl. 137—68 R 7 Claims



1. A breakaway coupling for joining together two pipes, the coupling having at least two separable parts through which a conduit extends for conveying fluid, one part being adapted for connection to one pipe and the other part being adapted for connection to the other pipe, one of the separable coupling parts having a hollow sleeve which extends about a portion of the other separable coupling part to define an annular space therebetween, the two separable coupling parts being secured together by frangible means, characterized by

(a) a pair of opposed annular pistons located in said annular space, said pistons being spaced axially apart to define therebetween a fluid chamber,

(b) transmission means interposed between the fluid chamber and the conduit to provide fluid pressure communication therebetween,

(c) connection means connecting the pistons with said separable coupling parts, whereby fluid pressure in said fluid chamber urges said coupling parts together,

(d) one or more frangible bolts securing one of said pistons to one of said separable coupling parts and

(e) latch means detachably securing said one piston to the other of said separable coupling parts,

(f) whereby, upon fracture of said frangible bolt or bolts, said one piston is separable from both said separable coupling parts to allow for separation of said parts, said latch means being operative to permit axial separation of said one piston and said other coupling part following fracture of the frangible bolt or bolts.

4,501,288

MARINE SPEEDOMETER ANTI-FOULING DEVICE

William J. Field, 10305 Bowerbank Rd., Sidney, B.C., Canada V8L 3L2

Filed Sep. 16, 1983, Ser. No. 532,694
Int. Cl.³ F16K 11/00
U.S. Cl. 137—240 9 Claims

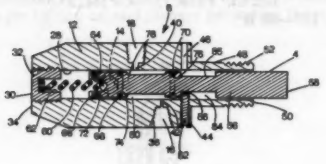
1. A valve for controlling a purging fluid for marine speedometer lines, the valve comprising:

a valve body with a bore extending in a longitudinal direction therein, a speedometer port, a pressurized fluid supply port and an impact tube port, the ports being spaced apart in the longitudinal direction and communicating with the bore;

a valve spool slidably received within the bore for reciprocation within the bore, the spool having three spaced apart seals between the bore and the spool and a first passageway between first and second said seals and between the spool and the bore; the spool having a first position wherein the speedometer port and the impact

tube port communicate through the passageway, the pressurized fluid supply port is isolated from the speedometer port and the impact tube port, and a third said seal and the first said seal are on opposite sides of the pressurized fluid supply port the spool having a second position wherein the impact port communicates with the pressurized fluid supply port, and the speedometer port is isolated from the impact tube port and the pressurized fluid supply port;

means biasing the spool towards the first position;



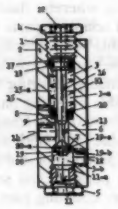
button means for manually moving the spool from the first position to the second position, the button means being connect to the spool and projecting outwardly from the valve body at one end of the bore; and means for venting the speedometer when the spool is in the second position, the means for venting comprising an opening in the valve body and a second passageway in the spool extending from the opening to the speedometer port in the second position of the spool.

4,501,289

FLUID PROPORTIONING DIVERTER VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Aug. 24, 1982, Ser. No. 410,870
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **10 Claims**



1. A fluid proportioning diverter valve comprising:

a single elongated housing unit with a central bore of different diameters passing therethrough including a first top end portion adaptable of being closed by a first top end closure means, and a second bottom end portion adaptable of being closed by a second bottom end closure means including a third intermediate diameter bore portion adjoining said top and bottom end portions of said bore substantially midway of said housing, said first top end portion defining a piston operating chamber and said second bottom end portion defining a valving chamber,

a set of fluid ports for fluid communication with said bore including a first bottom port means at the center of said bottom end closure means, a first side port means entering said bore via a housing wall adjacent said first bottom port means in said second bottom end portion of said bore and a second side port means on top thereof entering said bore via said housing wall substantially midway along the length of said intermediate diameter bore portion,

an elongated valve stem provided with a first top end and a second bottom end including a first seal inside a groove of said bottom end thereof is slidably received inside said bore and movable therein in an operable relationship with said fluid ports between said first top and second bottom end closure means, a second stem seal placed radially and secured permanently inside a stationary counterbore of said bore adjacent said top and intermediate portions for to prevent fluid leakage therebetween, said valve stem includes a piston means for actuating said valve stem between an open and a closed positions,

when said stem is in a first top position, an upper lid of said first seal is engaged in a first valve seat provided therein between said intermediate diameter bore portion and said second bottom end portion of slightly larger diameter for shutting off said second port entirely while allowing fluid communication between said first side and said first bottom port means until said stem is actuated from said first top position to a second selected position inside said bore allowing fluid communication between said first side port means, said second side port means and said first bottom port means prior to having a lower lip of said first seal engage a second valve seat inside said bottom end closure means thereby allowing fluid proportioning at selected ratios between said first, second and bottom port means,

when said stem is in another second selected position, said lower lip of said first seal is engaged in said second valve seat for allowing fluid communication between said first and second side port means while closing fluid communication to said bottom port means,

including means for top mounting said second seal within said counterbore with a biasing means for retaining said second seal therein,

means for top mounting said valve stem through said second seal into a position in said second bottom end portion of said bore to permit only said first seal to be mounted into said groove prior to said second end closure means being placed inside said second bottom end portion of said bore in a single step without disturbing or removing any other valve components thereby facilitating novel means of assemblying in said valve said piston means, said biasing means with said second seal and said first seal and also novel means of holding said stem therein physically by said first seal.

4,501,290

PRESSURE REGULATING MECHANICALLY AND ELECTRICALLY OPERABLE SHUT OFF VALVES

Oded E. Sturman, 18241 Andrea Cir. N.; Benjamin Grill, 9819 Etiwanda Ave., both of Northridge, Calif. 91329, and Lynn Harrison, 23554 Cherry St., Newhall, Calif. 91321

Filed Sep. 30, 1982, Ser. No. 429,459
Int. Cl.³ G05D *16/08, 16/20*
U.S. Cl. 137—495 **26 Claims**

1. A pressure regulating electrically operable shut off valve comprising

a housing including inlet and outlet chambers and a valve seat therebetween for fluid communication between said chambers,

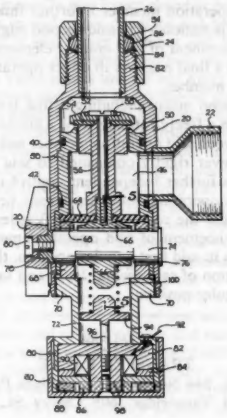
a valve closure member cooperatively disposed in said housing with respect to said valve seat so as to be encouraged by pressure in said outlet chamber toward a first position resting on said valve seat to block fluid communication between said inlet and said outlet chambers, said valve closure member being movable to a second position allowing fluid communication between said inlet and said outlet chambers,

electrically operable latch means

spring means coaxial with said valve member and operative in compression between said valve member and said latch means, when said latch means is in a first latch position, for yieldably encouraging said valve member toward said second position, whereby said valve may regulate the pressure of fluid in said outlet chamber by at least a partial balance between the outlet chamber pressure force on said

valve closure member encouraging said valve closure member toward said first position and the force of said spring means encouraging said valve closure member toward said second position,

said latch means being moveable between said first latch position holding said spring means in compression and a second latch position releasing the compression in said



spring means, said latch means having permanent magnet means for retaining said latch means in said first latch position, said latch means also having a coil responsive to a current pulse to momentarily substantially demagnetize said permanent magnet means to allow said latch means to move to said second latch position, and

means operative when said spring means is released to encourage said valve closure member to said first position.

4,501,291

RELIEF VALVE ARRANGEMENT

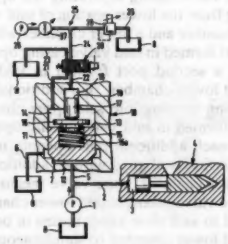
Ronald Siegrist, Oberuzwil, Switzerland, assignor to Vickers, Incorporated, Troy, Mich.

Filed Aug. 19, 1983, Ser. No. 524,682

Claims priority, application European Pat. Off., Aug. 19, 1982, 82107565.2

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—529 **6 Claims**



1. Relief valve arrangement for limiting system pressure within two selectable ranges of pressure settings, the arrangement comprising: means for delivering control pressure, means for delivering low pressure and

a main relief valve having a valve body including an inlet chamber connected to system pressure, an outlet chamber connected to low pressure, a first control chamber and a second control chamber,

a first piston formed as a valve member having a first piston area at said inlet chamber and a second piston area at said first control chamber,

a second piston having a third piston area and a fourth piston area at said second control chamber, said fourth piston area being distinctly different in size from said second piston area, and

a directional valve for connecting said control pressure to said first control chamber and said low pressure to said second control chamber, or said control pressure to said second control chamber and said low pressure to said first control chamber.

4,501,292

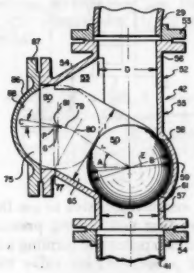
BALL-TYPE CHECK VALVE

Richard Maloblocki, Hinsdale, Ill., assignor to Ametc Development Company, Highland Park, Ill.

Filed Apr. 8, 1982, Ser. No. 366,600

Int. Cl.³ F16K *15/04*

U.S. Cl. 137—533.11 **11 Claims**



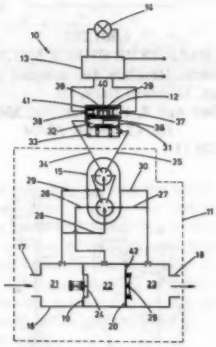
1. A check valve, comprising a spherical element, and a housing adapted to permit undirectional flow of a fluid through the housing and to contain the spherical element, the housing comprising a first vertically disposed cylindrical section including at least one top end element having a diameter which is less than the spherical element diameter, the first section defining a seat for mating with the spherical element in fluid-flow inhibiting contact, the housing further comprising a second cylindrical section having substantially straight sides and a diameter which is greater than the spherical element diameter and communicating with the first section, the second cylindrical section being inclined to the first cylindrical section and adapted such that when a fluid is caused to flow upward through the first cylindrical section, the spherical element is caused to move out of the first cylindrical section and diagonally upward within the second cylindrical section, a third valve housing section communicating with and intersecting the second section for receiving the spherical element, the second and third sections together defining an abrupt pivot line, the pivot line oriented such that after the spherical element has been caused to move out of the first section by the upwardly flowing fluid and to be positioned at the pivot line, a center of gravity of the spherical element is caused to move along a bi-ended arcuate path, a first end of the arcuate path requiring a first force to be supplied by the upwardly moving fluid to the spherical element to counteract the tendency of the spherical element to roll down into the first cylindrical section, a second end of the arcuate path requiring a second force, less than the first force, to counteract the tendency of the spherical element to roll down into the first cylindrical section, the spherical element having a center of gravity, the center of gravity being located forward of said pivot line even when the spherical element is urged to the extremity of its travel, whereby to encourage the spherical element to travel down said second section when fluid pressure on the spherical element is removed.

4,501,293

GAS FLOW RESPONSIVE SIGNAL OUTPUT MEANS

Owen D. Furlong, East Coker, Near Yeovil; Leonard Moore, Somerton, and Jonathan D. Ward, Ilminster, all of England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Sep. 8, 1982, Ser. No. 416,026
Claims priority, application United Kingdom, Sep. 9, 1981, 8127270
Int. Cl.³ F16K 37/00; F15C 4/00; G01L 9/00
U.S. Cl. 137—557 8 Claims



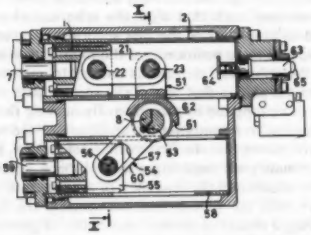
1. Signal output means responsive to gas flow, comprising a gas conduit having first and second pressure-datum valves arranged in downstream order and forming a chamber therebetween, the second pressure-datum valve being arranged to open at a lower pressure difference than is required for opening the first pressure-datum valve; and a flueric amplifier having a power jet port connected with the gas conduit on the upstream side of the first pressure-datum valve, opposed control pressure ports connected respectively with the chamber in the gas conduit between the first and second pressure-datum valves and with the gas conduit downstream of the second pressure-datum valve, and a vent port also connected to the gas conduit downstream of the second pressure-datum valve.

4,501,294

SEQUENTIAL OPERATION DEVICE FOR CONTROLLED MEMBERS

Giorgio Bormioli, Via Galileo Galilei, 11, 35100 Padova, Italy

Filed Nov. 4, 1982, Ser. No. 439,036
Claims priority, application Italy, Jan. 18, 1982, 19153 A/82
Int. Cl.³ G05G 9/08
U.S. Cl. 137—614.11 6 Claims



1. A sequential operation device for controlled members, comprising an operation member which can be driven to advance along a rectilinear path, which is perpendicular and laterally positioned with respect to a rotating control shaft of a first controlled member and directed towards a control element of a second controlled member, and movement transmission means operatively interposed between said operation member and said rotating shaft so that an initial advancement of said operation member along said path is able to cause a rotation of said shaft from a first angular position to a second angular position to effect the operation of said first controlled member, said transmission means having a clearance operative to allow said operation member a further final advancement, while the shaft is stationary in said second angular position, to effect the displacement of said control element from an initial rest position to a final position to effect operation of said second controlled member,

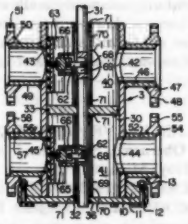
said transmission means including a first lever mounted on said shaft in a freely rotating way, a connecting rod interposed between said operation member and said first lever, a second lever rigidly connected to said shaft and connected to a further independent control operation member, and cooperating abutment means provided on said levers so that the rotation of said first lever during said initial advancement of said operation member causes, if said shaft is in said first angular position, the contemporaneous rotation of said second lever and said shaft to said second angular position.

4,501,295

TRANSFER VALVE

H. Jay Williams, 944 Northgate Dr., Allison Park, Pa. 15101, and Raymond Yauneridge, 605 Cherry St., Windber, Pa. 15963

Filed Apr. 14, 1982, Ser. No. 368,300
Int. Cl.³ F16K 11/02
U.S. Cl. 137—625.19 5 Claims



1. A transfer valve including a substantially cylindrical valve casing, a bottom plate closing the bottom of said valve casing, a cover plate closing the top of said valve casing, a separator plate within said valve casing separating the upper portion of said valve casing from the lower portion of said valve casing to form an upper chamber and a lower chamber within said valve casing, a first port formed in said valve casing opening into said upper chamber, a second port formed in said valve casing opening into said lower chamber, two additional ports formed in said valve casing opening into said upper chamber and two additional ports formed in said valve casing opening into said lower chamber, each additional port opening into said upper chamber being vertically aligned with an additional port opening into said lower chamber, shoe valve means in said upper chamber and shoe valve means in said lower chamber, actuator means connected to said shoe valve means in both said upper chamber and said lower chamber to simultaneously rotate said shoe valve means in said upper chamber and said shoe valve means in said lower chamber from one of said two additional ports opening into said upper chamber and into said lower chamber to the other of said two additional ports opening into said upper chamber and into said lower chamber, a non-resilient linkage connecting said actuator means to said shoe valve means in said upper chamber and a non-resilient linkage connecting said actuator means to said shoe valve means in said lower chamber to move said shoe valve means in said upper

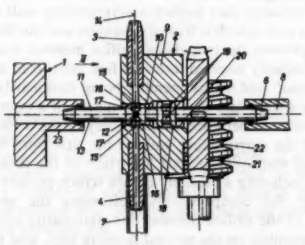
and lower chambers toward and away from an additional port in said upper chamber and an additional port in said lower chamber to open and close said two additional ports, said actuator means including a vertically and rotationally movable control rod located centrally of said valve casing and having an upper end extending through said cover plate, a lever attached to said upper end of said control rod for rotating said rod to move said shoe valve means in said upper chamber and said shoe valve means in said lower chamber between said two additional ports in said upper chamber and between said two additional ports in said lower chamber and for moving said control rod vertically to operate said non-resilient linkages to move said shoe valve means toward and away from two additional ports to open and close an additional port in said upper chamber and an additional port in said lower chamber, a cylindrical member extending upwardly from the upper surface of said cover plate and surrounding the upper end of said control rod, said cylindrical member having an arcuate slot formed therein extending through approximately 180° of its periphery, and a notch formed in said cylindrical member extending upwardly from each end of said arcuate slot and vertically aligned with the center line of an additional port in said upper chamber and the vertically aligned additional port in said lower chamber, said lever extending out of said cylindrical member through said arcuate slot, whereby movement of said lever from said notch at one end of said arcuate slot to said notch at the other end of said arcuate slot rotates said control rod and said shoe valve means from one of said additional ports in said upper chamber and the vertically aligned additional port in said lower chamber to the other additional port in said upper chamber and the vertically aligned additional port in said lower chamber so that said shoe valve means in said upper and lower chambers can simultaneously close one of said additional ports opening into said upper chamber and the vertically aligned additional port opening into said lower chamber so that fluid entering said upper chamber through said first port may flow out of the open additional port opening into said upper chamber and may enter said lower chamber through the open additional port opening into said lower chamber and exit from said lower chamber through said second port.

4,501,296

DEVICE FOR CHARGING AN ELECTROCHEMICAL MEASURING APPARATUS

Hermann Marsoner; Karl Harnoncourt, and Helmut List, all of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed Nov. 1, 1983, Ser. No. 547,589
Claims priority, application Austria, Nov. 19, 1982, 4229/82
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—625.41 **3 Claims**



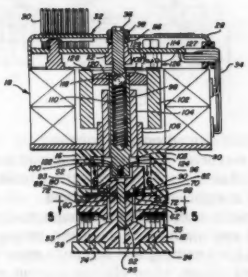
1. A device for charging an electrochemical measuring apparatus alternatively with sample, reference and cleaning media, comprising a fixed feed line for a measuring chamber of said apparatus, a control unit having separate input fittings respectively for the media and for connecting said fittings to said feed line, said control unit comprising a feeder part having a through bore, said input fittings for only the reference media being carried by said feeder part and having openings communicating with said bore, a fixed conduit for the sample and cleaning media, a pipe section extending through said bore and being rotatable about its central axis relative to said bore and relative to said feed line and said conduit, means for sealing said pipe section against the wall of said bore, the wall of said pipe section having at least one radial bore capable of communicating with said reference media openings one at-a-time upon relative rotation between said pipe section and said feeder part bore, one end of said pipe section extending into said feed line and being rotatably sealed thereagainst, an opposite end of said pipe section facing away from the measuring chamber defining one of said input fittings for the sample and cleaning media, said one input fitting extending into said conduit and being rotatably sealed thereagainst, and means cooperating with said pipe section to effect controlled rotation thereof.

4,501,297

ROTARY VALVE

Joseph Baker, Somerville, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 8, 1982, Ser. No. 366,728
Int. Cl.³ F16K *11/02, 31/02, 37/00*
U.S. Cl. 137—625.46 **9 Claims**



5. In a rotary valve including a body having a plurality of flow passageways therein, a rotor for providing communication between at least one pair of said flow passageways, said rotor being in sealing engagement with said body and drive means for rotating said rotor into alignment with various pairs of the flow passageways, the improvement wherein said drive means includes

a rotating member for engaging the rotor to impart rotation thereto, said rotating member having a substantially spherical surface and said rotor having a substantially cylindrical surface, the spherical surface of said rotating member contacting the cylindrical surface of said rotor for accommodating rocking of the rotor; and

a stationary member for applying an axial force to said rotor along the axis of rotation for sealing the rotor and the body.

4,501,298

SOLENOID ACTUATED VALVE DEVICE

Masami Inada, Kariya, and Kenji Hashimoto, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 1, 1982, Ser. No. 413,604
Claims priority, application Japan, Sep. 11, 1981, 56-144109
Int. Cl.³ F16K *11/07, 31/08*
U.S. Cl. 137—625.48 **4 Claims**

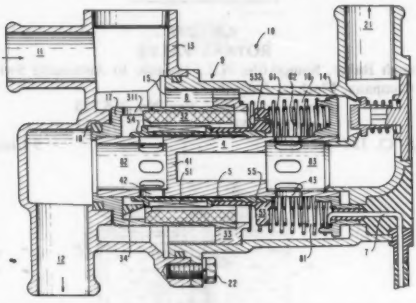
1. A solenoid actuated valve device for controlling the flow of fluid comprising:

a body having an inlet port, at least one outlet port and a bore communicating with said ports at the opposite ends thereof, respectively,

a magnetic hollow tubular core axially mounted within said body for dividing said bore into an annular outer chamber and at least one inner chamber communicating with said outlet and inlet ports, said core having at least one radially extending aperture therethrough for fluid communication between said chambers,

a non-magnetic bobbin, having valve means and at least two radially outwardly extending and circumferentially spaced projections, slidably mounted on an outer periphery of said core to control the effective open area of said aperture, said projections defining a first series of fluid passages therebetween for decreasing the dynamic fluid pressure axially acting thereon,

spring means seated at one end thereof against said projections of said bobbin for biasing said bobbin,



a solenoid coil wound on said bobbin,

permanent magnetic means secured in said body so that the magnetic flux thereof intersects the winding of said solenoid coil at right angles thereto, and

electromagnetic means defining a magnetic circuit with said core and said permanent magnetic means to provide a magnetic force causing said bobbin to move axially against said spring means when electric current passes through said solenoid coil, said electromagnetic means including a magnetic yoke and an annular member for supporting said yoke in said body, said annular member having radially outwardly extending and circumferentially spaced projections defining a second series of fluid passages for guiding the flow of fluid from said inlet port into said first series of passages between said projections of said bobbin.

4,501,299

PLUNGER-TYPE VALVE

Michael A. Klimowicz, Cupertino, Calif.; Vytautas J. Toliusis, Paw Paw Township, Van Buren County, and Stanley M. Loveless, Oshtemo Township, Kalamazoo County, both of Mich., assignors to Humphrey Products Company, Kalamazoo, Mich.

Filed May 21, 1982, Ser. No. 380,574

Int. Cl.³ F16K *11/02, 31/05*

U.S. Cl. 137—625.65 **20 Claims**

1. An electrically-operated plunger-type valve assembly, comprising:

housing means including first and second housing parts which are joined together and define an interior chamber at the interface therebetween;

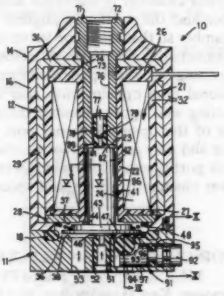
electrical winding means stationarily associated with said first housing part and including a central sleevelike spool having an electrical winding therearound, said sleevelike spool defining therein an elongated central opening which extends along a central longitudinal axis of the winding means and opens into said interior chamber;

said winding means including a magnetically conductive frame disposed in surrounding relationship to said electrical winding, said magnetically conductive frame including an end plate which extends across one axial end of said winding means and has a central opening therethrough aligned with the central opening of said sleeve, said end plate defining an axial boundary for said interior chamber;

plunger means of a generally T-shaped configuration supported for limited reciprocal axial movement along said longitudinal axis, said plunger means including an elongated substantially cylindrical stem movably guidably supported within the central opening of said spool, said plunger means including a radially enlarged platelike head fixed to one end of said stem and positioned within said interior chamber, said platelike head projecting radially outwardly from said stem so as to substantially radially overlap said end plate, said head having a back face which is positioned in axially opposed relationship to said end plate and is separated therefrom by a narrow air gap;

first and second ports formed in said housing means and communicating with said interior chamber, said first port extending through said second housing part from an outer surface thereof for direct communication with said interior chamber, said first port being substantially coaxially aligned with said longitudinal axis;

a cylindrical orifice member of a stiff elastomeric material stationarily seated on said second housing part within said first port and defining a small-diameter orifice therethrough for communication with said interior chamber, said orifice member having an inner end defining thereon an end surface which is disposed axially opposite said head



of said plunger means, said end surface defining thereon an annular valve seat in surrounding relationship to said orifice;

said orifice member being insertable into said first port from the axially outer end thereof so as to control the desired axial spacing between said valve seat and said head, said second housing part having a surrounding wall defining said first port which is free of shoulders and the like which would prevent the cylindrical orifice member from being axially slidably inserted into said first port from the outer end thereof, said orifice member being stationarily held in position within said first port by means of a compressive interference fit between the periphery of the orifice member and the surrounding wall of the first port, said surrounding wall over at least a portion of the axial extend thereof including a plurality of ribs which project radially inwardly for compressively deforming the peripheral portion of the orifice member for stationarily seating the orifice member on the second housing part, said plurality of ribs being circumferentially spaced around the first port and extending axially thereof to permit the orifice member to be axially slidably inserted into said first port; and

said head of said plunger means defining thereon a nondeformable front face which is disposed axially opposite said annular valve seat and is positioned closely adjacent same, said front face sealingly engaging said valve seat when said plunger means moves into engagement with said orifice member to define a valve closing position.

4,501,300
CONTINUOUS CATHETER FLUSHING APPARATUS

John B. Murphy, West Roxbury, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

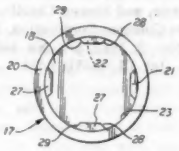
Filed Nov. 1, 1982, Ser. No. 437,979
Int. Cl.³ F16K 7/12
U.S. Cl. 138—46 2 Claims

1. A valve assembly, comprising
walls defining a cavity having first and second opposed inner surfaces,
means defining two passageways communicating with said cavity at spaced areas of said first inner surface,
means forming a ridge on said first inner surface and extending above it that is parallel to a line between said areas,
a valve actuating member of elastic material having a base section and a tab extending therefrom, said base section being compressed between said first and second inner surfaces so as to form a seal with said first surface, said base section draping over said ridge so as to form a channel communicating between said passageways, and
means defining an opening in the wall having the second inner surface, said tab extending through said opening to the outside of the valve assembly.

4,501,301
PIPE THREAD PROTECTOR

Roger L. Snow, Sr., 17307 Edenbridge Ct., Spring, Tex. 77379, and Thomas J. Atkinson, 14711 Oak Bluff Ct., Houston, Tex. 77070

Division of Ser. No. 284,690, Jul. 20, 1981, Pat. No. 4,399,092. This application Jul. 11, 1983, Ser. No. 512,689
Int. Cl.³ F16L 57/00
U.S. Cl. 138—96 T 9 Claims

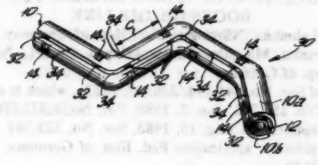


1. A thread protector for threaded pipe or the like, formed in a mold, comprising
a cup shaped or hollow cylindrical member of soft, elastic thermoplastic material having a rear end or closed end wall, a cylindrical side wall with a smooth cylindrical exterior surface free from longitudinal mold part lines and an open forward end,
a plurality of circumferentially oriented lugs spaced circumferentially from each other on and extending from the inner surface of said side wall and integral therewith and of a size and shape permitting the same to be forced over the threaded end of a pipe and to fit into and engage the threads thereof to prevent easy and accidental removal therefrom,
each of said lugs having a rear face toward the rear end of said hollow member extending substantially normal to the axis thereof and a forward face in the form of an inclined surface forming an acute dihedral angle therewith sloping toward said open end,
each of said lugs having side walls on each side thereof tapering outward from said rear face and said forward face, and
each of said lugs being sufficiently thin to permit the same to be compressed completely into the wall of said hollow member during formation and removal from said mold and having tapered edges on each side of the lug facilitating the removal of said hollow member from said mold without shearing the same from the wall.

4,501,302
AIR GAP PIPE

Jon W. Harwood, Toledo, Ohio, assignor to APX Group, Inc., Toledo, Ohio

Filed Oct. 14, 1983, Ser. No. 541,709
Int. Cl.³ F16L 11/00
U.S. Cl. 138—113 5 Claims

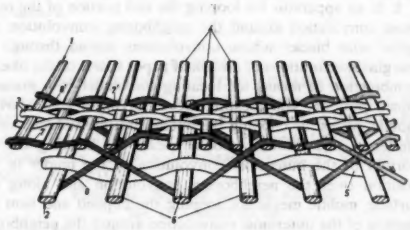


1. A non-linear air gap pipe for carrying heated vehicular exhausts, said air gap pipe comprising:
an inner pipe bent into a selected non-linear configuration for carrying the vehicular exhaust gases; and
an outer pipe concentrically disposed around the inner pipe with an air gap therebetween, said outer pipe including a plurality of resilient supports extending inwardly and contacting the inner pipe, said outer pipe being formed by first and second longitudinal halves with said first and second halves being joined together at selected locations along opposed longitudinal sides such that vents are defined between said selected locations, whereby said outer pipe and said vents control the flow of heat from said inner pipe.

4,501,303
FORMING FABRIC

Lars B. Österberg, Halmstad, Sweden, assignor to Nordiskafilt AB, Halmstad, Sweden

Filed Jun. 14, 1982, Ser. No. 388,345
Claims priority, application Sweden, Jun. 23, 1981, 8103920
Int. Cl.³ D03D 15/02
U.S. Cl. 139—425 A 4 Claims



1. An improved double-layer type of forming fabric for use in papermaking, cellulose and similar machines, said forming fabric consisting of two integral weaves, each one of said

weaves comprising its separate sets of respective warp threads and weft threads, the first one of said weaves, the top cloth, arranged in the position of use of said fabric to face the material being formed, said top cloth being made up by thinner threads than the second one of said weaves, the bottom cloth, the improvement comprising sequestial positions in the pattern of said top cloth where a thread in the weave thereof does not appear, pairs of adjacent additional threads running in the same direction and interconnecting said first and second weaves, said pairs of threads repeating in sequence and alternately passing downwards from said top cloth to interweave with said bottom cloth, each of said respective pairs interweaving with said top cloth in one of said sequential positions whereby to complete the pattern of said top cloth.

4,501,304

APPARATUS FOR LOOPING THE OUTERMOST CONVOLUTIONS OF SPIRAL BINDERS FOR NOTE BOOKS OR THE LIKE

Hartmut Lehmann, Nürtingen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

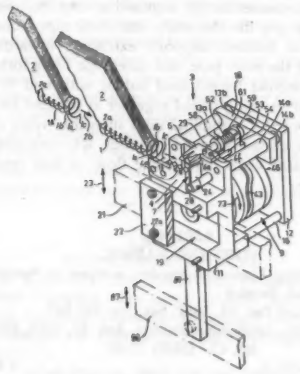
Division of Ser. No. 341,194, Jan. 20, 1982, , which is a division of Ser. No. 156,262, Jun. 3, 1980, Pat. No. 4,327,780. This application Aug. 16, 1983, Ser. No. 523,746

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950120

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—103 **2 Claims**



1. In an apparatus for looping the end portion of the outermost convolution around the neighboring convolution of a spiral wire binder whose convolutions extend through the marginal perforations of a stack of paper sheets or the like, the combination of means for locating the binder in a predetermined position, said locating means having a guide surface; mobile means for clipping the outpermost convolution of the binder in said position; mobile means for bending the end portion of the outermost convolution of the binder in said position over the neighboring convolution and along said surface; mobile means for looping the clipped and bent end portion of the outermost convolution around the neighboring convolution of the binder in said position, said looping means including a rotary device having an eccentric wire engaging portion; and means for moving said clipping, bending and looping means, including a plurality of rotary cams.

4,501,305

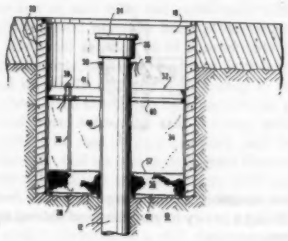
RECEPTACLE FOR COLLECTION OF FUEL SPILLS

J. Richard Zola, 35 Lora Stirling Dr., Morristown, N.J. 07960, and Stanley W. Prenosil, 920 Lyndale, Rochester, Mich. 48063

Filed Jun. 16, 1983, Ser. No. 504,993

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—86 **11 Claims**



1. A receptacle for collecting fluids spilled during discharge of said fluids into a fill pipe or other opening through which filling of a container or liquid passage is to be effected comprising:

a substantially vertical, continuous, outer side wall of flexible material impervious to said fluid, the upper periphery of said wall forming an open neck when said receptacle is disposed to collect said fluids;

a water permeable substantially horizontal bottom wall having a central aperture, the periphery of said bottom wall being joined throughout its periphery to the lower periphery of said side wall;

an inner substantially vertical wall joined at its lower end to said aperture and a neck at the opposite upper end, said neck being adapted to surround the neck of a fill pipe or other aperture through which fluids are discharged into a container for said fluids; and

a layer of absorbent material on said bottom wall adapted to absorb said fluid.

4,501,306

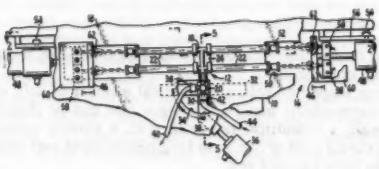
AUTOMATIC SYRINGE FILLING SYSTEM

George Chu, Sunnyvale, and Sharon Casella, San Jose, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed Nov. 9, 1982, Ser. No. 440,324

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—94 **24 Claims**



1. Apparatus for automatically filling each of a plurality of syringes substantially simultaneously with a predetermined amount of fluid, comprising:

a manifold having an input port for receiving the fluid and a plurality of output ports each adapted to be connected to one of said plurality of syringes;

a single pump for supplying the fluid to the input port of said manifold;

a plurality of detectors respectively located at predetermined spaced positions from the output ports of said manifold so as to detect when the plunger of each syringe connected to said manifold has been extended a predetermined amount; and

means responsive to said detectors for interrupting the supply of fluid to said manifold when all of the plungers of syringes connected to said manifold have been extended by said predetermined amount.

4,501,307

MACHINE FOR FILLING AND CLOSING TWO-PIECE HARD GELATINE CAPSULES

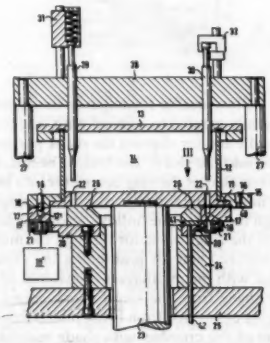
Theo Moser, Steinenberg, and Götz Mader, Korb-Kleinheppach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,330

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110483

Int. Cl.³ B65B *1/24*

U.S. Cl. 141—258 **5 Claims**



1. A machine for filling and closing hard gelatine capsules, wherein a container having powder therein includes means for pressing said powder into openings for forming preformed charges of powder in a revolving dispensing disc positioned beneath said container, means for pushing the preformed charges of powder as blanks through said disc into portions of capsules, means positioned beneath said disc having at least one recess for holding a lower capsule portion, said container comprising a jacket which surrounds said dispensing disc, a lid for said container, said lid having apertures for said pressing and pushing means, characterized in that said dispensing disc comprises a ring for revolving with said disc and provided with means for receiving an upper capsule portion, and wherein said means positioned beneath said disc comprises at least one curve-controlled element for displacing said recess for holding said lower capsule portion.

4,501,308

HINGE TEMPLATE GUIDE WITH HOLDING PINS

Frank E. Sherman, 2050 Federal, Costa Mesa, Calif. 92627

Filed May 16, 1983, Ser. No. 494,945

Int. Cl.³ B27F *5/12*

U.S. Cl. 144—144.5 **18 Claims**

1. A template for providing a routing tool with a pre-established pattern wherein the improvement comprises:

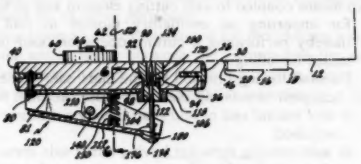
means for forming a pre-established pattern that is to be routed;

means for securing said forming means into proximate connected relationship with an area that is to be routed in the form of at least a pin that is driven into said proximate area to be routed;

a pivoting lever;

a support upon which said lever is pivotally connected;

means for attachment of said support to said forming means; and,



means for connecting said lever to said pin so that after said pin is driven into a surface that is to be routed said lever can be pivoted to remove said pin from the surface into which it has been driven.

4,501,309

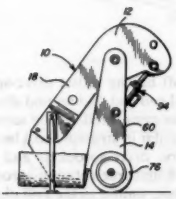
PORTABLE WOOD SPLITTER

Leon Sinden, 412 Sperry, Bakersfield, Calif. 93307

Filed Aug. 8, 1983, Ser. No. 521,523

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **10 Claims**



1. A wood splitter including a pair of upstanding vertically elongated components having upper and lower ends, means pivotally interconnecting the upper ends of said components for relative swinging movement of the lower ends thereof toward and away from each other, the lower end of one of said components including abutment surface means facing toward the lower end of the other of said components, the lower end of said other component including wedge means facing toward said abutment surface means, motor means operatively connected between said components for relatively angularly displacing said components to forcibly swing the lower ends of said components toward each other, a first of said components including depending foot structure supported therefrom for stationary support of said first component from an upwardly facing support surface such as a ground surface and the second of said components including support wheel means journalled from the lower end thereof for rolling support from said support surface.

4,501,310

OSCILLATING CUTTING APPARATUS

Guillermo A. Valdes, 4350 NW. 8 Ter., Room 300, Miami, Fla. 33126; Fernando F. Figueredo, 524 Ridgewood Rd., Key Biscayne, Fla. 33149; Benjamin G. Pacheco, 1090 W. 69 Pl., Hialeah, Fla. 33014, and Armando Framil, 45 SW. 28 Rd., Miami, Fla. 33129

Filed Sep. 29, 1982, Ser. No. 427,836

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 R **3 Claims**

1. A cutting apparatus comprising:

(a) a flexible cutting element having first and second ends and cutting teeth disposed at intervals in a complete circle

around the outer periphery of the cutting element, said cutting teeth being disposed alternately in opposite directions to enable said cutting element to cut a selected material when an oscillating motion is imparted,

(b) a frame coupled to said cutting element for receiving and guiding said cutting element,

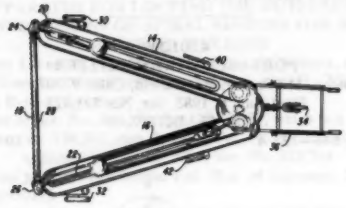
(c) means coupled to said cutting element and to said frame for imparting an oscillatory motion to said element thereby performing a cutting operation, said oscillating means including:

i. a shaft having first and second ends, said first end being coupled to rotating means to cause the shaft to rotate,

ii. said second end of said shaft having a rotating sprocket attached,

iii. said rotating sprocket having a first side-sprocket coupled on one side and a second side-sprocket coupled on the opposite parallel side,

iv. said first side-sprocket being connected to the first end of a first shaft and the second side-sprocket being connected to the first end of a second shaft,



v. said first shaft having a first drive-sprocket connected on the second end and said second shaft having a second drive-sprocket connected on the second end,

vi. a first chain, similar in structure to a bicycle chain, placed around said first drive-sprocket, and extended to and placed around a first free-rotating-sprocket,

vii. a second chain, similar to the first chain, placed around said second drive-sprocket and extended to and placed around a first free-rotating sprocket,

viii. a first drive-arm connected on its first end to said first chain by a free rotating pin connection and connected to a first drive block at its second end,

ix. a second drive arm connected on its first end to said second chain by a free rotating pin connection and connected to a second drive block at its second end,

x. guide means connected to said first and second drive blocks and to the cutting element so that when the two chains are caused to rotate, the two chains in turn cause the two drive arms to push the two drive blocks back and forth along a straight line thus converting the chains' rotating motions to oscillating motions.

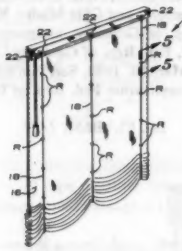
4,501,311

SYSTEM FOR PRODUCTION OF ROMAN TYPE SHADES

Glenn A. Folland, 405 Cedar Ave., Minneapolis, Minn. 55454

Filed Oct. 21, 1983, Ser. No. 544,365
Int. Cl.³ E06B 9/00
U.S. Cl. 160—127 **5 Claims**

1. In connection with Roman type shades formed of multilayers of material and including pulling cords strung through rings attached to the shade such that the shade is generally flat when down and the shade falls into pleats when the pulling cords are pulled, the improved ring attachment system comprising: ring attachment devices comprising, in combination: an array of linearly connected, automatically distributing, ring connectors formed integrally with an array of rings, with the ring connectors including a T-shaped member having a shank portion including a first end and a second end and having a crossbar including a first end and a second end, with the first end of the shank portion being integrally attached to the ring, with the second end of the shank portion being integrally attached to the crossbar substantially midway between the first and second ends of the crossbar; with the ring connectors being connected in the array by a carrier bar having a multiplicity of integrally formed tongues, each tongue having a free end, with the free ends of the tongues being integrally attached to the crossbars of the ring connectors generally opposite of the connection of the shank with the crossbar and with the crossbars of the array of connectors being generally parallel to each other and perpendicular to the carrier bar; and an attachment tool comprising, in combination: a hollow needle having a slot, means for automatically feeding the array of connectors



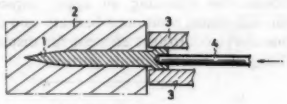
serially to the hollow needle for aligning the crossbar of the connector generally parallel to, aligned with, and for introduction into the needle and for aligning the shank portion with and for introduction into the slot of the hollow needle; and means for forcing the crossbar of the ring connector into and through the needle and moving the shank portion of the ring connector into and through the slot of the hollow needle for inserting the shank portion of the ring connector through the multilayers of Roman shade material and for positioning the crossbar to be parallel and abut with the multilayers of material on the opposite side of the shade from the ring for preventing the shank portion of the ring connector from being pulled from the shade by the abutment of the crossbar with shade material and thus firmly attaching the ring to the shade in a one step operation.

4,501,312

METHOD FOR FORMING A HOLE OF EYELESS SUTURE NEEDLE

Kanji Matsutani, Takanezawa, Japan, assignor to Matsutani Seisakusho, Takanezawa, Japan

Filed Sep. 21, 1981, Ser. No. 304,196
Claims priority, application Japan, Jun. 29, 1981, 56-99604
Int. Cl.³ B21G 3/18
U.S. Cl. 163—5 **10 Claims**



1. A method of forming an eyeless suture needle having a tapered end, an intermediate portion, and a base end, the base end having a hole, said method comprising: providing a needle material having oxidation resistance; providing a heat resistant pressing tool having a melting point higher than that of the needle; positioning the needle in a holder with the base end of the needle extending beyond the holder; providing a tubular restraining tool having an inner diameter larger than the outer diameter of the needle to surround the base end of the needle; heating the base end of the needle to a temperature near its

melting point; pressing the heat resisting perforating tool into the base end of the needle material while the base end of the needle material is near its melting point to form a hole and an enlarged circumferential outer surface defined by the interior of said tubular restraining tool; and cutting off part of the enlarged circumferential surface to provide a needle of uniform outer diameter at its base end and intermediate portion.

4,501,313

TRANSPORT UNIT FOR CASTINGS

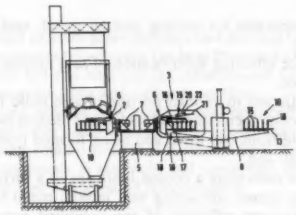
Martin Weis, Ettlingen, and Adolf Scholz, Karlsruhe, both of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,179

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145316

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—404 **8 Claims**



1. In a foundry apparatus for cleaning castings with mold sand adhering thereto, comprising conveyor means for moving a casting to a supporter means for moving said casting from said conveyor means into and through an abrasive blasting apparatus for cleaning mold sand from said casting while rotating said casting about a generally horizontal axis as it is being cleaned in said abrasive blasting apparatus, wherein the improvement comprises a transport means for receiving and supporting said casting as it is moved by said conveyor means to said supporter means, said transport means including a grid-like lower support for said casting and connection means for connecting said transport means to said supporter means, said transport means being held in a generally horizontal position when connected to said supporter means by said connection means, and wherein said supporter means includes a keeper element which is mounted on said supporter means and which forms a basket with said transport means for retaining said casting when said transport means is connected to said supporter means for movement through said abrasive blasting apparatus while being rotated about a generally horizontal axis, said keeper element being mounted on said supporter means for movement relative to said transport means so that said basket can be opened and shut.

4,501,314

CASTING SUPPORT APPARATUS FOR CONTINUOUS CASTING EQUIPMENT

Masaru Wakabayashi, Osaka, and Kuniaki Ono, Nara, both of Japan, assignors to Hitachi Shipbuilding & Engineering Ltd., Osaka, Japan

Continuation of Ser. No. 372,946, Apr. 29, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,779

Int. Cl.³ B22D *11/124, 11/12*

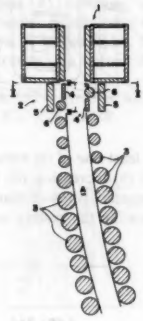
U.S. Cl. 164—441 **6 Claims**

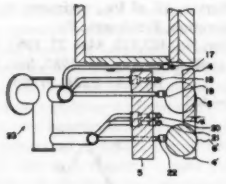
1. A casting support apparatus for continuous casting equipment comprising pairs of cooling plate means arranged in opposed relation to each other immediately below a mold and in successive vertically divided stages for guiding and supporting the casting as held between the pairs of plate means, said stages including an upper stage and at least one successive lower stage, each pair of plate means in each stage being composed of pairs of separate cooling plates spaced horizontally and individually detachably mounted to one of a pair of back plates, each cooling plate being provided with groove means;

a plurality of cooling rolls each rotatably mounted in a space formed between each two adjacent cooling plates in each stage, each cooling roll being formed with annular groove means on its outer periphery;

cooling plate jet nozzles arranged for introducing a cooling fluid into a space between the casting and the cooling plates in each stage from above the cooling plates;

cooling roll jet nozzles arranged for introducing a cooling





fluid into a space between the casting and the cooling rolls in each stage from above the cooling rools; and

auxiliary jet nozzles arranged for applying a cooling fluid to the rear surfaces of the cooling plates in each stage; each cooling plate in said upper stage being provided with extension means positioned immediately above and adjacent cooling roll in said upper stage, the upper portions of the cooling plates in each said successive lower stage being positioned immediately below the respective cooling rolls in the adjacent stage above said successive lower stage and in vertically overlapping relation with the lower portions of the cooling plates in said adjacent stage.

4,501,315

METHOD OF CONTROLLING AND REGULATING OPERATIONAL PARAMETERS OF A MACHINE FOR CONTINUOUSLY CASTING BANDS BETWEEN CYLINDERS, ALLOWING ADHESION TO BE AVOIDED

Serge Bercovici, Grenoble, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Jan. 18, 1982, Ser. No. 339,846

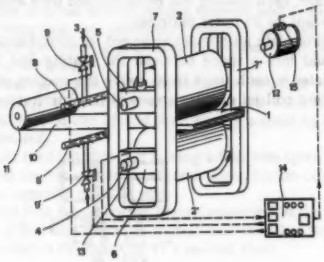
Claims priority, application France, Jan. 19, 1981, 81 01185

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—454 **15 Claims**

1. A method of controlling and regulating operational parameters of a machine for continuous casting bands between cylinders to avoid adhesion by the detection of microadhesion, said method comprising measuring the frequency of variation

of the torque exerted by a band on one of the cylinders, comparing the frequency of the torque variations corresponding to each cylinder measured with a reference frequency, and, when the measured frequency is greater than the reference frequency, doing at least one of (a) reducing the casting speed of the machine, and (b) increasing the lubricant flow rate, until the measured frequency is lower than the reference frequency followed by increasing the casting speed.



4,501,316

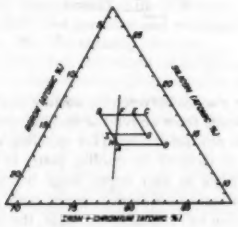
METHOD OF CASTING AMORPHOUS METALS

S. Leslie Ames, Sarver; Thomas H. Gray, Pittsburgh, and Lewis L. Kish, Sarver, all of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 382,823, May 27, 1982, Pat. No. 4,450,206. This application Aug. 31, 1983, Ser. No. 528,289

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—463 **2 Claims**



1. A method of casting an amorphous strip material having a width of at least one inch, a thickness of at least 0.001 inch, a 60 Hertz core loss of less than 0.163 watts per pound at 12.6 kilogauss, saturation magnetization (B_{75H}) of at least 14 kilogauss, a coercive force of less than 0.045 oersteds and is at least singularly ductile, comprising the steps of:

melting an alloy consisting essentially of 6–10% boron and 14–17% silicon, 0.5–3.0% chromium, by atomic percentages, with no more than incidental impurities, and the balance iron;

while maintaining the alloy molten, continuously delivering a stream of molten alloy through a slotted nozzle and onto a casting surface disposed within 0.025 inch of the nozzle;

continuously moving the casting surface past the nozzle at a speed of 200 to 10,000 linear surface feet per minute;

at least partially solidifying the strip on the casting surface; and

separating the at least partially solidified strip from the casting surface.

4,501,317

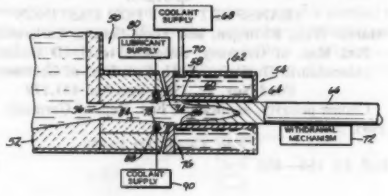
CASTING SYSTEM HAVING LUBRICATED CASTING NOZZLES

Robert S. Sokolowski, Madison, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 3, 1982, Ser. No. 438,674

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—472 **11 Claims**



1. An apparatus for casting molten metal, said apparatus comprising:

a mold for effecting solidification of said molten metal into an ingot;

means adjacent to an inlet portion of said mold for feeding said molten metal into said mold, said feeding means being separate from said mold and being formed from a porous material; and

means for delivering a cooled lubricant to a surface of said feeding means contacting said molten metal to substantially prevent adhesion of any solidified metal on said surface, said lubricant delivering means comprising a first passageway through which said lubricant flows embedded within said porous material of said feeding means, a second concentric passageway containing a coolant located within said first passageway, and at least one opening in said first passageway for permitting lubricant from said first passageway to flow through said porous material to said molten metal contacting surface.

7. A process for casting molten metal, said process comprising:

providing means for supplying molten metal to a mold adjacent an inlet portion of said mold, said supplying means being separate from said mold;

feeding said molten metal into said mold; and

at least partially solidifying said molten metal within said mold, wherein the improvement comprises:

forming at least one wall of said molten metal supply means from a porous material; flowing a lubricant through a first passageway embedded in said porous material; flowing a coolant through a second concentric passageway located within said first passageway; and expelling said lubricant from said first passageway so that cooled lubricant flows through said porous material to a surface of said at least one wall contacting said molten metal to substantially prevent adhesion of any solidified metal on said surface and to reduce the likelihood of tearing any solidified metal within said molten metal supply means.

4,501,318

HEAT RECOVERY AND AIR PREHEATING APPARATUS

William H. Hebrank, 14 Hermitage Rd., Greenville, S.C. 29615

Filed Sep. 29, 1982, Ser. No. 428,189

Int. Cl.³ F28D *17/00*

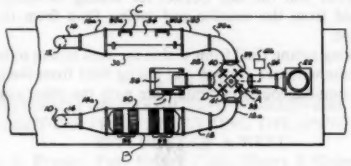
U.S. Cl. 165—1 **17 Claims**

12. In a method of recovering heat and heating replacement air in industrial heat treating ovens of the type which includes alternately cycling a flow of exhaust gases and replacement air through a set of thermal storage units carried exteriorly of the oven which are connected to the oven by means of spaced ports, storing the heat from the exhaust in one of the thermal storage units while purging the heat previously stored in the

other of the thermal storage units to heat the replacement air, wherein the method comprises:

providing a plurality of hot end heat storage filter elements in said thermal storage unit in series flow relation having a high thermal storage capacity for storing heat;

providing a plurality of cold end heat exchange condensor elements in series flow arrangement with said hot end heat storage filter elements in said thermal storage unit having a thermal storage capacity lower than said hot end heat storage filter elements for condensing volatile contaminants in said exhaust gases;



passing said exhaust gases through said hot end heat storage filter elements transferring the heat from said exhaust flow into said hot end heat storage elements and filtering solid contaminants from said exhaust gas flow;

passing said exhaust flow through said cold end condensor elements after removing said solid contaminants and condensating volatile gases in said exhaust flow and collecting said condensate in said cold end condensor element; and

removing said condensated contaminants.

4,501,319

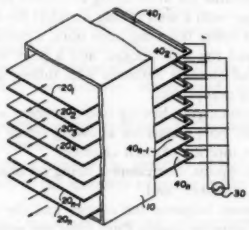
PIEZOELECTRIC POLYMER HEAT EXCHANGER

Seymour Edelman, Silver Spring, Md., and Lowell D. Ballard, Sterling Park, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 30,966, Apr. 17, 1979, abandoned. This application Jan. 24, 1983, Ser. No. 460,221

Int. Cl.³ F28D *11/06*; F28G *7/00*

U.S. Cl. 165—84 **2 Claims**



1. A heat exchanger having a plurality of fluid conductive channels for relatively warm and cold fluids respectively separated by a plurality of heat conductive partitions, each of said channel partitions consisting of flexible piezoelectric polymer material; and means connected to each of said partitions applying an alternating current of a predetermined frequency thereto to cause said piezoelectric polymer material to achieve a flexual resonance condition and thereby generate a wave pattern in said partitions to cause a substantial portion of the surface of said partitions to periodically undulate, said last-named means including a signal source and electrode means formed on each partition coupled to said signal source, said electrode means consisting of at least first and second electrodes, first circuit means commonly coupling one side of said signal source to a predetermined number of said first electrodes, and second circuit means commonly coupling the opposite side of said signal source to a predetermined number of said second electrodes.

4,501,320

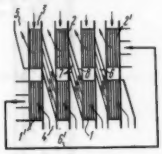
MULTIFLOW TUBULAR AIR HEATER

Adolf U. Lipets, prospekt Lenina 150a, kv. 38; Boris I. Alexandrov, ulitsa Udarnikov, 8, kv. 19; Svetlana M. Kuznetsova, Revprospekt 16, kv. 21; Jury I. Okerblom, ulitsa Mira 13, kv. 25, all of Podolsk Moskovskoi oblasti; Jury A. Ershov, ulitsa Vorovskogo 8/1, kv. 1, Moscow; Nadezhda A. Frolova, ulitsa Zheleznodorozhnaya, 8/2, kv. 4, Podolsk Moskovskoi oblasti; Valery A. Malkis, ulitsa Ordzhonikidze, 5, kv. 4, Podolsk Moskovskoi oblasti; Ivan A. Sotnikov, ulitsa Mashinostroitelei, 32, kv. 114, Podolsk Moskovskoi oblasti; Alexei Z. Fedosov, ulitsa Burakova, 7, korpus 2, kv. 18, and Robert A. Petrosyan, ulitsa Planernaya, 16, korpus 3, kv. 67, both of Moscow, all of U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,178

Int. Cl.³ F28F *9/22*

U.S. Cl. 165—144 **8 Claims**



1. A multiflow two-pass tubular air heater with tube bundles located in first and second tiers in gas ducts, comprising: inlet air conduits supplying air to the tube bundles of the first tier in a same overall direction with respect to gas flow; outlet air conduits exhausting air from each tube bundle of the second tier; bypass air conduits supplying air from said tube bundles of said first tier to the tube bundles throughout the height of the second tier, said bypass air conduits connecting each tube bundle of said first tier to a respective tube bundle of said second tier of an adjacent gas duct, the tube bundles of the first tier of a last gas duct being connected to the tube bundles of the second tier of a first gas duct in a manner that all the tube bundles of all the gas ducts are united by the bypass air conduits into a single circuit and in the same overall direction.

4,501,321

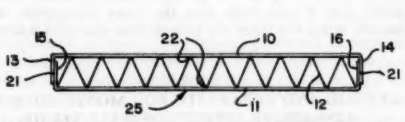
AFTER COOLER, CHARGE AIR COOLER AND TURBULATOR ASSEMBLIES AND METHODS OF MAKING THE SAME

John D. Real, Jamestown; David J. Twichell, North Harmony, and Lauren R. Weed, Jamestown, all of N.Y., assignors to Blackstone Corporation, Jamestown, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,518

Int. Cl.³ F28F *3/12*

U.S. Cl. 165—153 **6 Claims**



1. A turbulator assembly comprising an outer channel member having a bottom wall and two transverse side edges, an inner channel member having a bottom wall and two transverse side edges, the side edges of the inner channel interfitting closely within the side edges of the outer channel member to form a generally rectangular enclosure with adjustable separa-

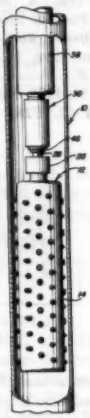
tion, and an accordian shaped fin assembly between said channels having side edges of a plurality of accordian folds which extend above the channel side edges in contact with the bottom wall of both the inner and outer channel members.

4,501,322

HYPER CLEANING CASING BRUSH

Edwin L. Martin, P.O. Box 303, Bakersfield, Calif. 93302

Filed Dec. 8, 1983, Ser. No. 559,466
Int. Cl.³ E21B *37/08*
U.S. Cl. 166—173 **3 Claims**



1. A casing brush including a cylindrical, hollow thick-walled body having upper and lower ends, tubular swivel means carried by the upper end of said body for removal attachment to a supporting tubing section, said body including means closing the lower end of the interior thereof, said body including a plurality of circumferentially and axially spaced blind bores formed therein, a plurality of wire brushes, means removably mounting a wire brush from each of said blind bores and with said wire brushes projecting radially outwardly from said body, said body also including circumferentially and axially spaced radial bores, each of said radial bores having a tubular nozzle removably mounted therein, each of said nozzles including an outer discharge end and an inner inlet end, each of said inlet ends being operative to receive fluid under pressure introduced into said tubular body through said tubular swivel means at the upper end thereof, means supporting each of said spray nozzles from said thick-walled body for shifting between a first extended position projecting outwardly of said thick-walled body and a second retracted position at least substantially fully retracted within the outer confines of said thick-walled body, spring means operatively connected between said nozzles and thick-walled body yieldingly biasing said nozzles toward said extended positions, the outer ends of said brushes being spaced greater radial distances from the center axis of said body than the outer extremities of said nozzles, when the latter are in their first extended positions.

4,501,323

METHOD AND APPARATUS FOR MONITORING THE CORROSIVE EFFECTS OF WELL FLUIDS

F. Glenn Lively, Spring, and Kenneth O. Robison, Humble, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Dec. 27, 1982, Ser. No. 453,064
Int. Cl.³ E21B *23/03, 49/08*
U.S. Cl. 166—250 **3 Claims**

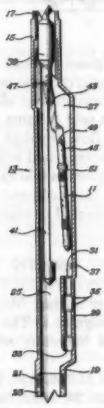
1. A method of monitoring corrosive effects of fluids in a well, comprising the steps of:

installing a well tubing mandrel downhole in well tubing, said well tubing mandrel having a main bore, a side pocket offset from the main bore, a passage between the main bore and the side pocket, and a port between the side pocket and an annulus between the well tubing and well casing;

mounting a pair of coupons in a carrier having two chambers sealed from each other, one coupon being mounted in each chamber;

placing the carrier into the side pocket, said carrier having port means for allowing fluids to communicate with the interior of each chamber, and sealing means between the carrier and the side pocket for sealing between casing fluid from the annulus and tubing fluid from the main bore;

allowing tubing fluid from within the well tubing to communicate with one coupon and casing fluid from the annulus to simultaneously communicate with the other coupon;



removing the carrier from the side pocket; and

inspecting the coupon.

2. An apparatus for monitoring corrosive effects of fluids in a well, for use with a well tubing mandrel having a main bore, a side pocket offset from the main bore, a passage between the main bore and the side pocket, and a port between the side pocket and an annulus between well tubing and well casing, the apparatus comprising:

a cylindrical carrier, having two chambers sealed from each other and port means for allowing fluids to communicate with the interior of each chamber;

a pair of coupons, one coupon being secured in the interior of each chamber; and

sealing means between the carrier and the side pocket for sealing between casing fluid from the annulus and tubing fluid from the main bore.

4,501,324

METHOD FOR IDENTIFYING THE SOURCE OF AN OIL

Burton B. Sandiford, Placentia; E. Reinold Fett, Fullerton, and Harold J. Bickford, Placentia, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,506
Int. Cl.³ E21B *47/10, 43/22*
U.S. Cl. 166—250 **15 Claims**

1. A method for tracing a first oil comprising:

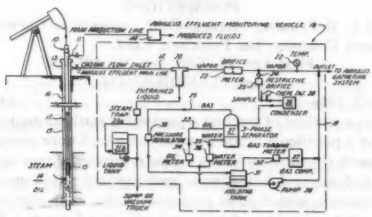
(a) incorporating into said first oil a halogenated hydrocarbon tracer material component comprising at least one halohydrocarbon or halocarbon containing at least 3 halogen atoms and at least 2 carbon atoms per molecule, and having a halogen/carbon atomic ratio of at least one third;

(b) injecting said first oil into a subterranean reservoir;
(c) obtaining from said reservoir a second oil suspected to be or to contain a portion of the first; and
(d) analyzing the second oil for the presence of the halohydrocarbon or halocarbon component by gas chromatography, using a pulsed electron capture detector.

4,501,325
METHOD FOR PREDICTING WORKOVERS AND SHUT-INS FROM ANALYZING THE ANNULUS EFFLUENT OF A WELL

Terry L. Frazier, Paso Robles, Calif.; Henry J. Grimm, Allentown, Pa.; John F. Rooney, Houston, Tex.; Richard S. Allen, Houston, Tex.; Alfred Brown, Houston, Tex., and Donald S. Mims, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 305,439, Sep. 25, 1981,. This application Oct. 6, 1983, Ser. No. 539,602
Int. Cl.³ E21B *43/16*
U.S. Cl. 166—250 **14 Claims**

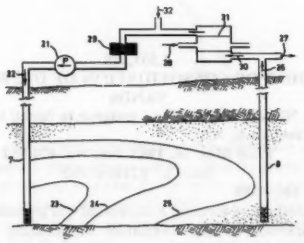


1. A method of evaluating the annulus effluent of a producing well used in a steam injection process to determine the best disposition for the well, which comprises:
(a) measuring the flow rate of the annulus effluent;
(b) condensing the annulus effluent;
(c) separating the annulus effluent into three phases of light hydrocarbon condensate, water and noncondensable gases;
(d) measuring the quantities of each of the three phases of the annulus effluent;
(e) calculating a ratio of the quantity of light hydrocarbon condensate to the quantity of water in the annulus effluent;
(f) calculating minimum economic oil production from well costs and estimated production revenues;
(g) calculating estimated volume of oil contacted by steam in the formation from previous correlations, said correlations previously drawn between steam and light hydrocarbon condensate produced as vapor after contacting predetermined volumes of oil having the same characteristics as oil from said producing well; and
(h) determining the best disposition of the well using the following guidelines:
(1) if said ratio of light hydrocarbon condensate to water is greater than about 0.08 and actual tubing and annulus production is greater than minimum economic oil production, the well should be left to produce "as is";
(2) if said ratio is greater than about 0.08 and actual tubing and annulus production is less than minimum economic oil production, a workover should be performed on the well;
(3) if said ratio is less than about 0.08 and actual tubing and annulus production is greater than the minimum economic oil production, the well should be left to produce "as is";
(4) if said ratio is less than about 0.08 and estimated volume of oil contacted by steam is less than the minimum economic oil production and actual tubing and annulus production is less than the minimum economic oil production, the well's tubing and annulus production should be shut-in; and
(5) if said ratio is less than about 0.08 and estimated volume of oil contacted by steam is greater than the minimum economic oil production and actual tubing and annulus production is less than the minimum economic oil production, a workover should be performed on the well.

4,501,326
IN-SITU RECOVERY OF VISCOUS HYDROCARBONACEOUS CRUDE OIL

Neil R. Edmunds, Calgary, Canada, assignor to Gulf Canada Limited, Toronto, Canada

Filed Jan. 17, 1983, Ser. No. 458,517
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—272 **21 Claims**



1. A method for improving the recovery of viscous hydrocarbonaceous oil from a subterranean formation penetrated by at least one injection well and at least one production well, said wells being in fluid communication with said formation, comprising:
(a) establishing a heated communication path between said injection and production wells, in a communication development step,
(b) injecting heated fluid having a viscosity of at least one centipoise at 200° C. into said injection well, in a recirculation step, until a suitable portion of said subterranean formation is heated, said heated fluid being heated to a temperature from substantially 100° C. to 300° C. before being injected, and

(c) recovering produced hydrocarbonaceous oil from said formation, in a recovery step, at least substantially 20% by mass of said heated fluid being viscous hydrocarbonaceous oil produced from said production well.

4,501,327

SPLIT CASING BLOCK-OFF FOR GAS OR WATER IN OIL DRILLING

Philip Retz, 1783 Lanier Pl., NW., Washington, D.C. 20009

Continuation-in-part of Ser. No. 399,259, Jul. 19, 1982, abandoned. This application Apr. 27, 1983, Ser. No. 487,238

Int. Cl.³ E21B *43/10*

U.S. Cl. 166—285 **39 Claims**

1. A method for sealing the wall of a bore hole, the bore hole having a predetermined diameter, the method comprising the steps of:

forming a liner of resilient sheet material into a scroll having a smaller diameter than the predetermined diameter;

locating said scroll around a shaft having a squeegee at one end;

inserting said liner into the bore hole preceded by said squeegee;

allowing said scroll to expand whereby its diameter is increased to substantially the predetermined diameter; and

pressing said liner against the wall of the bore hole.

4,501,328

METHOD OF CONSOLIDATION OF OIL BEARING SANDS

Dean P. Nichols, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,952

Int. Cl.³ E21B *43/02*

U.S. Cl. 166—288 **6 Claims**

1. A method of forming a semi-solid but permeable coating on unconsolidated sand formations surrounding an oil well, comprising the steps of:

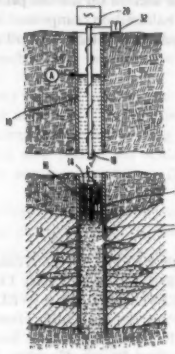
allowing said well to fill with oil;

heating a portion of the oil in said well, said heat being applied at a rate and for a period of time such that the oil juxtaposed to the source of the heat is separated into a lighter fraction and a heavier fraction, said heat being applied to said well at a point above the region of oil production in said well, whereby the fluid in the well in the vicinity of any voids caused by production in said well is not substantially heated;

permitting said lighter fraction to migrate generally upwardly in said well;

applying pressure to the upper end of said well, forcing the heavier fraction downwardly and out into said formation, through any such voids; and

permitting said heavier fraction to be cooled by contact with said formation, whereby said sand is generally consolidated by said heavier fraction having cooled into a semi-solid but permeable coating on said formation.



4,501,329

NON-ABRASIVE PARTICULATE MATERIAL FOR PERMEABILITY ALTERATION IN SUBSURFACE FORMATIONS

Coral L. DePriester, Moraga, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 18, 1983, Ser. No. 485,921

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—292 **3 Claims**

1. In a method of treating a permeable earth formation containing a petroleum crude from within a well bore penetrating said earth formation wherein a fluid is injected down said well bore and into said formation to mobilize said petroleum crude, and wherein said fluid is prepared at the earth surface and pumped down said well bore and into said formation from a position along said well bore, said fluid including finely divided amorphous particulate material adapted to be pumped with said fluid and positioned in said permeable formation as said mobilized crude moves in response to said injected fluid; the improvement comprising the steps of:

(a) a selecting said particulate material from the group consisting of graphite, carbon black, clay suspensions, quartz and other minerals reduced in size to behave as non-abrasive amorphous materials when flowing with said mobilized crude and having grain sizes in the range of 100 to 600 mesh; and

(b) grading the size range of the particulate material such that the 10% size of the particulate material is between 6 and 100 times smaller than the 90% grain size of the formation materials.

4,501,330

WELL COMPLETION APPARATUS AND METHOD

Juan A. Garcia, Kingwood, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Feb. 3, 1984, Ser. No. 576,827

Int. Cl.³ E21B *43/11*

U.S. Cl. 166—297 **11 Claims**

1. Apparatus for completing a well in which a well bore is drilled from the earth's surface and is provided with a protective casing string extending from the earth's surface to a selected depth in said well bore, comprising:

a production casing string extending from said earth's surface through said protective casing string;

an outer tubing string positioned in said production casing

string and having a reduced-diameter stinger section extending from the lower end of said outer tubing string;

an inner tubing string provided with upper and lower spaced-apart fluted hangers and extending from said earth's surface through said outer string into said production casing string;

said production casing string having upper and lower sections, said lower section being of smaller diameter than said upper section;

the lower portion of said upper section being stepped to provide upper and lower polished bore receptacles;

said stinger section of said outer tubing string being provided with an annular external seal unit which sealingly engages said polished bore wall of said lower receptacle; and

means on said inner tubing string and shoulder means formed on said outer tubing string and on said production tubing string for controlling vertical movement of said outer tubing string and said stinger seal unit during high-pressure temperature and density changes in said well.

4,501,331

METHOD OF COMPLETING A WELL

Emmet F. Brieger, Albuquerque, N. Mex., assignor to GEO Vann, Inc., Houston, Tex.

Continuation of Ser. No. 512,233, Jul. 11, 1983, abandoned. This application Feb. 29, 1984, Ser. No. 584,654

Int. Cl.³ E21B *34/12, 43/11*

U.S. Cl. 166—297 **7 Claims**

1. Method of completing a well comprising the steps of:

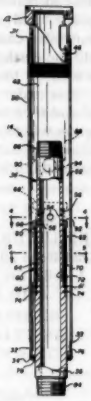
dividing the borehole into an upper and a lower annular area by running a packer actuated vent assembly downhole to a tubing string with the vent thereof being in the open position; connecting a bar actuated vent assembly in underlying relationship respective to the packer actuated vent assembly; connecting a jet perforating gun below the bar actuated vent assembly;

setting the packer and using the setting action for closing the open vent of the packer actuated vent assembly;

communicating the tubing interior with the lower annular area by dropping a bar downhole through the tubing string until the bar arrives at the bar actuated vent assembly, whereupon the downward motion of the bar is arrested and the dissipated energy used for opening the bar actuated vent assembly;

detonating the jet gun by allowing the bar to continue to fall down through the tool string, arresting the downward motion of the bar and using the dissipated energy for detonating the shaped charges of the jet gun;

whereupon, the casing is perforated and production flows through the perforations, up the lower annulus into the



port of the bar actuated vent assembly into the tool string, and up the tubing to the surface of the ground.

4,501,332

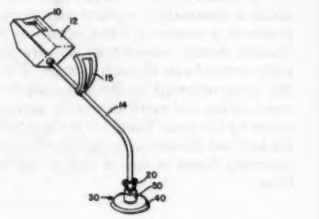
HAND CARRIED PORTABLE WEEDER CONVERTIBLE TO A CULTIVATOR APPARATUS

Robert O. Straayer, Houston, Tex., assignor to Evolution Enterprises, Inc., Houston, Tex.

Filed Sep. 29, 1982, Ser. No. 427,874

Int. Cl.³ A01D *35/26*

U.S. Cl. 172—41 **5 Claims**



1. A hand carried and operated portable cultivator comprising an elongated support means having a handle at one end and a power head with a rotatable driver means at the other end; motive power means for rotatably driving said driver means about an axis adapted by an operator to be arranged from a position inclined to the earth to be cultivated to a perpendicular position thereto; said motive power means including said power head at said other end; a shaft means operatively connected to said power head on said axis; a cultivator member; attachment means including a spacer member for attaching said cultivator member to said shaft means, said cultivator member including a disc with a central circular top wall portion and with a depending flange around the circumference thereof, the outer wall portion of said flange inclined radially outwardly and downwardly from the top wall portion, the distance from the top of said top wall portion to the bottom of said depending flange being more than twice as large as the thickness of said top wall; said spacer member being more than twice as long as the distance from said top of said top wall portion to the bottom of said depending flange whereby said spacer member spaces the top wall portion of said cultivator

member a distance from said power head to permit said cultivator member to be positioned a substantial distance under the earth while said power head remains above said earth; said elongated support means and handle being adapted to permit an operator to manipulate said elongated support means whereby said cultivator member can be arranged at an angle to the earth and moved into the earth for causing the depending flange of said cultivator member to cut through and penetrate said soil to a buried position under said soil without interference of said power head and then said cultivator member can be manipulated to a position wherein said flat top wall portion is parallel to the surface of said earth to maintain the buried position of said cultivator and cultivate the earth.

4,501,333

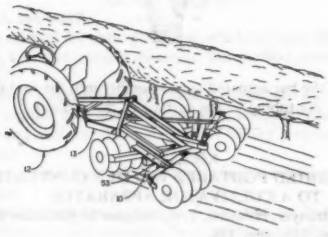
DISC TYPE AGRICULTURAL IMPLEMENT

Bernard O. Domries, 12281 Road 29, Madera, Calif. 93637

Filed Nov. 2, 1981, Ser. No. 317,154

Int. Cl.³ A01B *21/08*

U.S. Cl. 172—441 **14 Claims**



8. An improved disc type agricultural implement comprising a rigid main frame adapted for earth traversing movement, an arm pivotally mounted on the rigid main frame for movement about a substantially vertical axis through a range of pivotal positions, a mounting frame borne by the arm for movement relative thereto substantially toward and from said substantially vertical axis through a range of longitudinal positions, a disc gang mounted on the mounting frame for earth engagement during said earth traversing movement, and an assembly borne by the main frame for releasably fixing the main frame, the arm and the mounting frame relative to each other and the mounting frame in one of said pivotal and longitudinal positions.

4,501,334

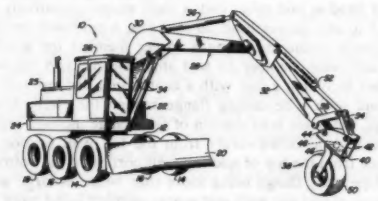
WHEELED EXCAVATOR HAVING A DOZER BLADE AND A BOOM-MOUNTED STABILIZER WHEEL

Michael V. Ptacek, Potosi, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jul. 7, 1983, Ser. No. 511,600

Int. Cl.³ B62D *11/02*; E02F *3/96, 9/02*

U.S. Cl. 172—832 **1 Claim**



1. In combination with a excavator including an undercarriage supported on front, intermediate, and rear pairs of driven ground wheels with one of the wheels of each pair being driven separately from the other of each pair and with the intermediate pair of wheels being mounted slightly lower than the front and rear pairs of wheels, a superstructure rotatably mounted on the undercarriage and carrying an articulated boom structure and control means therefor, a dozer blade and control means therefor being mounted on the undercarriage, the improvement comprising: wheel means mounted on the boom structure and said control means for the boom structure including means for positioning said wheel means ahead of the blade and exerting down pressure thereon for causing the undercarriage to rock rearwardly about said intermediate pair of wheels so as to bring said rear pair of wheels into firm engagement with the ground and in this way stabilize the excavator for fine grading operation.

4,501,335

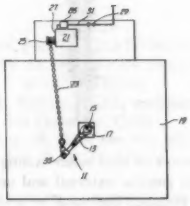
METHOD AND APPARATUS FOR USE IN DRILL STRING MAKE UP

Steven N. Gann, 12004 Royal Coach Dr., Yukon, Okla. 73099

Filed Oct. 28, 1983, Ser. No. 546,620

Int. Cl.³ B25B *23/14*

U.S. Cl. 173—12 **5 Claims**



1. A device for use with a drill string make up tong having a tong arm, a tong winch having a tong winch clutch, and a tong winch line extending between said tong winch and said tong arm, comprising:

angle sensing means for sensing an angle between said tong arm and said tong winch cable and producing a signal indicative of said angle;

tension sensing means for sensing tension applied to said tong winch line and producing a signal indicative of said tension; and

clutch deactivation means connected to said angle sensing means and said tension sensing means for receiving signals therefrom and for deactivating said torque winch clutch responsive to signals from said angle sensing means and said tension sensing means corresponding to a predetermined torque applied to a drill string during make up such that torque greater than this predetermined torque is not applied by said tong winch.

4,501,336

METHOD AND APPARATUS OF A SELF-ALIGNING SLEEVE FOR THE CORRECTION OF THE DIRECTION OF DEVIATED BOREHOLES

Billy W. Kemp, P.O. Box 2102, New Iberia, La. 70560, and William S. Brashear, P.O. Box 156, Moody, Tex. 76957

Filed Jun. 3, 1982, Ser. No. 384,778

Int. Cl.³ E21B *44/00*

U.S. Cl. 175—61 **9 Claims**

1. A self-aligning sleeve apparatus slidable over a section of flexible drill string assembly having a rotatable drill bit for correcting the direction of a deviated borehole, comprising:

a. a non-rotating tubular sleeve slidable over that member of the flexible drill string assembly adjacent the drill bit;

b. first elliptically-shaped protrusion means attached to said

sleeve for centering and stabilizing said sleeve while in the borehole;

c. second eliptically-shaped protrusion means, having a greater exterior circumference than said first protrusion

means, attached to said sleeve for guiding the direction of said drill string assembly; and

d. retaining means attached to the lower end of said flexible drill string member, preventing said sleeve from sliding off of said flexible drill string member.

4,501,337

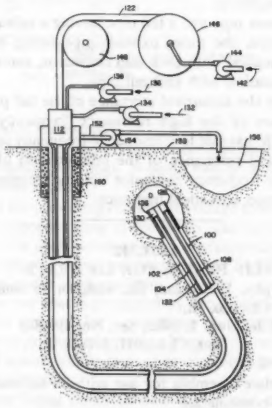
APPARATUS FOR FORMING AND USING A BORE HOLE

Ben W. O. Dickinson, III, San Francisco, and Robert W. Dickinson, San Rafael, both of Calif., assignors to Bechtel National Corp., San Francisco, Calif.

Division of Ser. No. 169,759, Jul. 17, 1980, Pat. No. 4,431,069. This application Nov. 14, 1983, Ser. No. 525,219

Int. Cl.³ E21B *7/08, 7/20*

U.S. Cl. 175—171 **77 Claims**



1. In apparatus for forming a bore hole:

(a) eversible elongate tube means including outer and inner spaced, flexible, tubular walls interconnected at their forward ends by a rollover area capable of being moved forwardly by fluid pressure to thereby move the inner wall relative to the outer wall when the outer wall is in a fixed position relative to the rollover area, whereby said inner wall undergoes a transformation in shape to become said outer wall at said rollover area, said outer and inner walls defining an annular space therebetween for receiving a pressurized driving fluid to cause said rollover area to be moved forwardly, the inner wall defining within its interior a central passageway,

(b) means for securing said outer wall in a fixed position relative to said rollover area, and

(c) a hollow central pipe at least partially disposed in said central passageway and having a port near the rollover area, said central pipe being movable with respect to said inner wall and adapted to be coupled with a source of pressurized drilling fluid to permit drilling fluid to flow through the central pipe and out of the port thereof to progressively drill a formation in advance of the rollover area as the rollover area moves fowardly under the influence of said driving fluid.

4,501,338

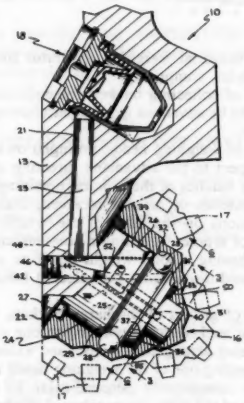
GREASE PUMP FOR SEALED BEARING ROTARY CONE ROCK BITS

Lance D. Underwood, Lafayette, La., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 8, 1983, Ser. No. 520,964

Int. Cl.³ E21B *10/24*

U.S. Cl. 175—229 **8 Claims**



1. A rotary cone rock bit including a bit body, a rotatable cutter, bearing means including a journal extending from said bit body for promoting rotation of said cutter mounted on said journal, said journal further comprises a first portion with a first diameter, a second portion with a second diameter, said second diameter being smaller than said first diameter, a radially disposed journal bearing thrust surface being formed between said first portion and said second portion, and a seal between said rotatable cutter and said body, a positive displacement lubricant circulation system comprising:

a lubricant reservoir formed by said bit body,

passage means formed by said bit body for channelling lubricant from said lubricant reservoir to said bearing means and from said bearing means to said lubricant reservoir,

a vane guide port formed in said second portion of said journal, said vane guide port is oriented substantially transverse to an axis of said journal, said vane guide port supports a vane means within said port, said vane means forms first and second ends, said first end of said vane is biased by resilient means to ensure said second end of said vane contacts a vane reciprocating means operable by said cutter to move said vane within said port, said vane reciprocating means is an eccentric track formed in said cone,

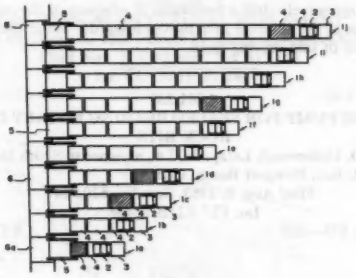
rotation of said cutter circulates lubricant through said passage means from said reservoir to said bearing means and back to said reservoir during operation of said bit within a borehole.

4,501,339

AUTOMATIC WEIGHING APPARATUS

Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 20, 1982, Ser. No. 420,113
Claims priority, application Japan, Sep. 24, 1981, 56-151751
Int. Cl.³ G01G *19/22, 13/02;* **B65B** *1/30, 3/04*
U.S. Cl. 177—25 **6 Claims**



1. A combinatorial weighing apparatus for automatically weighing articles, comprising:

a plurality of collecting buckets for collecting the articles, adapted to be advanced along a path having an advancing direction;

a plurality of weighing heads, arranged on a diagonal row with respect to the advancing direction of the path, for receiving batches of the articles, obtaining weight values of the batches of articles received, computing weight combinations on the basis of the weight values of the batches of articles, selecting a combination of batches of articles having a total weight equal or closest to a set weight, and discharging the selected batches of articles; and

a plurality of groups of discharge buckets, each group of discharge buckets corresponding to one of the weighing heads, being arranged in a row, and extending from the corresponding one of the weighing heads to the path in a direction substantially perpendicular to the advancing direction of the path, the number of discharge buckets in each row increasing by one in the advancing direction of the path so as to determine the angle of the diagonal row of weighing heads with respect to the advancing direction of the path, the discharge buckets being adapted to move along the rows from the weighing heads to the path in synchronization with the advance of the collecting buckets so that the discharge buckets receive batches of articles from the weighing heads and discharge the batches of articles into the collecting buckets and so that each collecting bucket receives a selected combination of batches of articles.

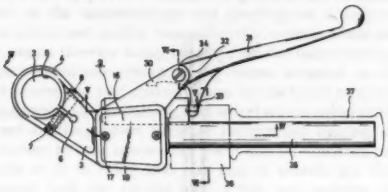
4,501,340

HYDRAULIC MASTER CYLINDER FOR A MOTORCYCLE, OR THE LIKE

Takeo Yoshida, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,296
Claims priority, application Japan, Sep. 19, 1981, 56-148031
Int. Cl.³ B62K *23/02*
U.S. Cl. 180—219 **9 Claims**

1. In a hydraulic master cylinder for a motorcycle having a handlebar and a handle grip mounted at an axially outside end portion of said handlebar, the improvement comprising a body defining an oil reservoir therein, said body being mounted at an axially inside end portion of said handlebar and in an axially



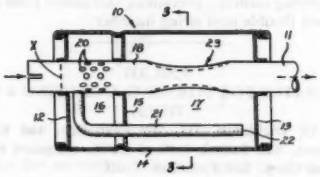
aligned relationship with said handle grip, said body having a portion bulging radially outwardly with respect to said handlebar.

4,501,341

LOW FREQUENCY MUFFLER

Adrian D. Jones, 944-956 South Rd., Edwardstown, Australia

Continuation-in-part of Ser. No. 242,936, Mar. 12, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,557
Int. Cl.³ F01N *1/02*
U.S. Cl. 181—250 **6 Claims**



1. A muffler comprising

a first and a second Helmholtz resonator, the first having a relative volume compliance and relatively high resonance frequency and the second having a relatively low resonance frequency;

a main exhaust pipe and a tail pipe having a relative acoustical instance, the mean exhaust pipe being in gas flow communication with each said resonator, and in gas flow communication with said tail pipe,

and wherein the acoustical inertance of the tail pipe and the compliance of the high resonance frequency resonator being such that said low resonance frequency substantially matches the resonance of the combination of said high resonance frequency resonator volume's compliance and said tail pipe acoustical inertance.

4,501,342

SLIP PLATES FOR LIFT RACK

John W. Murphy, Waukegan, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Jun. 1, 1983, Ser. No. 499,845
Int. Cl.³ G01L *5/00*
U.S. Cl. 187—8.41 **6 Claims**

1. A slide plate assembly for use with an automotive rack, comprising in combination

a base plate,

a plurality of guide rails mounted on the top face of said plate in substantial mutually parallel relationship,

a top plate having an upper face on which a wheel of an automotive vehicle is adapted to rest,

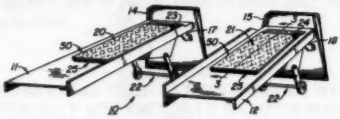
a plurality of sets of wheels mounted to the bottom of said

top plate with the wheels in each set resting on a respective one of said rails,

each of said sets of wheels including at least two wheels,

removable locking means interconnected between said top plate and at least one of said rails for holding said top plate in assembled relationship with said base plate,

a plurality of pairs of spaced apart, elongated brackets depending from the bottom of said top plate, and



a plurality of axles mounted in parallel relationship between each of said pairs of brackets,

said wheels in each of said sets being rotatably mounted on said axles between a respective pair of said brackets,

at least one of said rails includes an elongated, upwardly offset portion, and

said removable locking means includes a locking pin removably mounted to one of said brackets and extending beneath said offset portion of said one of said rails.

4,501,343

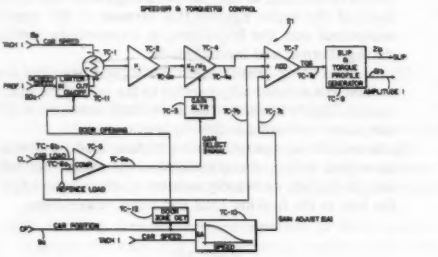
ELEVATOR CAR LOAD AND POSITION DYNAMIC GAIN COMPENSATION

Jalal T. Salihi, Manchester, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 12, 1982, Ser. No. 434,013

Int. Cl.³ B66B 1/30

U.S. Cl. 187—29 R **8 Claims**



1. An elevator comprising:

a polyphase electric motor, said motor having N phases and corresponding windings, N being two or more;

a D.C. power source;

an inverter for providing current or voltage from said source to each stator winding in the motor, said inverter having an input for each winding and a corresponding output;

a position encoder for providing a signal (TACH) that identifies the motor shaft position;

an elevator car that is propelled by the motor;

an elevator control for controlling the operation of the inverter to produce alternating N phase current or voltage for said stator windings to control motor speed (r.p.m.), slip and direction;

the elevator being characterized in that said control comprises:

means for providing a signal (AMPLITUDE) in response to the TACH signal to control motor speed (r.p.m.);

means for providing a signal (SLIP) in response to the TACH signal to control the difference between the motor r.p.m. and the frequency (F SYNCH) of the alternating current or voltage that is supplied to the motor by the inverter;

means responsive to the SLIP signal and TACH signal for providing a signal that repeats at F SYNCH, said signal identifying an angular position on a sine curve, and for providing N second signals, each representing the Y-coordinate on said sine curve at different angular positions thereon, said positions being equally spaced apart by 360°/N, said N second signals being provided in a successive sequence during each motor rotation, the sequence in one motor direction being the reverse of the sequence in the opposite direction;

means for varying the magnitude of each second signal as a function of the AMPLITUDE signal;

means for applying each second signal to a different one of the inverter inputs according to said successive sequence;

means for providing a dictated motor speed signal in response to the TACH signal, said dictated motor speed signal representing a desired motor speed;

means for providing a cab load signal that represents the load in the car; and

means for providing a first error signal in response to said dictated motor speed signal and said TACH signal, said error signal representing the difference between the actual motor speed and the desired motor speed, and for providing a second error signal by amplifying said first error signal in relation to said cab load signal so that the magnitude of said first error signal is increased when the motor is about to be started if the cab load is greater than a certain load;

said means for providing said AMPLITUDE signal and means for providing said SLIP signal being responsive to said second error signal.

4,501,344

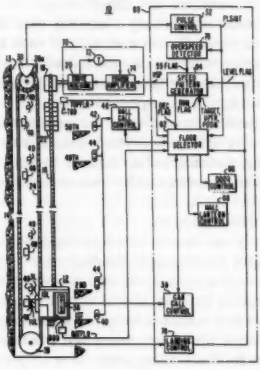
SPEED PATTERN GENERATOR FOR AN ELEVATOR CAR

Vladimir Uherek, Troy Hills Township, Morris County, and Matthew F. Kersen, Union, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1983, Ser. No. 523,994

Int. Cl.³ B66B 1/30

U.S. Cl. 187—29 R **10 Claims**



1. A method of generating a landing speed pattern for use in stopping an elevator car at a target floor, comprising the steps of:

deriving a first speed pattern equation from the closed loop transfer function of the elevator system the elevator car is associated with,

deriving a velocity equation which defines the desired actual car landing velocity,

combining the first speed pattern equation and the velocity equation to provide a second speed pattern equation,

and implementing said second speed pattern equation to provide a landing speed pattern.

4,501,345

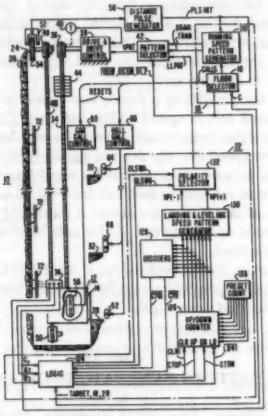
ELEVATOR SYSTEM

James Lowry, Hicksville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1983, Ser. No. 557,791

Int. Cl.³ B66B *1/40*

U.S. Cl. 187—29 R **13 Claims**



1. An elevator system, comprising:

a building having a plurality of floors,

an elevator car mounted for movement in said building to serve the floors,

motive means for moving said elevator car and for stopping said elevator car at a target floor,

zone means establishing a landing zone having a predetermined dimension on each side of each floor,

zone detector means on said elevator car for detecting the zone means of a target floor and for providing predetermined signals in response thereto,

logic means responsive to the predetermined signals provided by said zone detector means, said logic means providing distance pulses related to both a predetermined standard increment of car movement and car travel direction,

an up/down counter,

counter preset means for presetting said counter, before the elevator car enters the landing zone of a target floor, to a count value related to said predetermined landing zone dimension in terms of said standard increment,

count direction means for providing count direction signals indicative of car movement and whether the elevator car, when in the landing zone of a target floor, is moving towards or away from the target floor,

said counter being responsive to said count direction signals, with said counter being decremented by said count direction signals when the elevator car is moving towards the target floor, and incremented by said count direction signals when the elevator car is moving away from the target floor,

and speed pattern means providing a speed pattern for said motive means in response to the count on said counter.

4,501,346

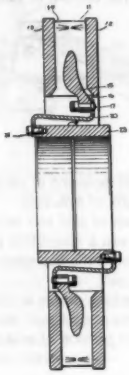
DISC BRAKE ASSEMBLY

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 5, 1982, Ser. No. 354,994

Int. Cl.³ F16D *65/12*

U.S. Cl. 188—218 XL **10 Claims**



1. A disc brake assembly comprising in combination:

(a) a brake ring;

(b) hub disposed within and concentric with said brake ring;

(c) pairs of resilient cantilever arms, the arms of each pair extending axially and radially from their connections to opposite ends of the hub respectivelv to the brake ring, each arm resiliently supporting the brake ring for thermally elongating and contracting in radial and axial amounts matched to the thermal elongations and contractions of the brake ring so that stresses in the arms are minimized and the brake ring is transversely stabilized during thermal and inertial loads;

(d) the arms being prestressed to have their principal longitudinal axis substantially parallel to the axis of the hub, but canted slightly inwardly relative to their connection to the hub under no load conditions; and,

(e) the arms being operable under braking load conditions to have their principal axis parallel to the axis of the hub or canted slightly outwardly relative to their connection to the hub as the braking load and temperature rises.

4,501,347

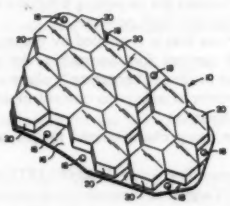
SEGMENTED DISC BRAKE PAD

Frank T. Cerny, Ramsey, N.J., and Irving Lapsker, Monroe, N.Y., assignors to Abex Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 418,506, Sep. 15, 1982, abandoned. This application Jul. 6, 1983, Ser. No. 511,353

Int. Cl.³ F16D *69/00*

U.S. Cl. 188—250 G **6 Claims**



1. A disc brake pad for railroad use comprising a rigid back

plate having a top side and a bottom side; a mounting bracket secured to the bottom side of the back plate; a flexible metallic carrier plate attached to the top side of the back plate; a plurality of individual friction elements each having a braking surface area of less than two square inches, and a height to braking surface area ratio not exceeding 0.6 and each of the friction elements is mechanically attached to the flexible metallic carrier plate to allow the individual elements to flex when they engage a disk to enable them to more fully engage the braking surface.

4,501,348

TORSIONAL OSCILLATION DAMPER WITH LATERALLY DISPLACEABLE DAMPER MEMBER

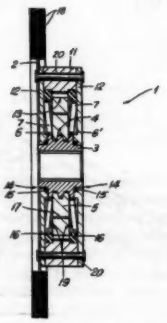
Dieter Lutz, Schweinfurt, and Wolfgang Thieler, Hassfurt-Uchenhofen, both of Fed. Rep. of Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,377

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130227

Int. Cl.³ F16D *3/64, 3/80*

U.S. Cl. 192—106.1 **15 Claims**



1. A torsional oscillation damper comprising

a first damping member and a second damping member mounted for rotation about a common rotational axis;

a coupling member operatively arranged in torque transmitting engagement between said first and second damping members;

said coupling member being connected in fixed rotative engagement with said first damping member and being axially displaceable relative to at least one of said damping members in the direction of said rotational axis; and

spring means applying a spring force to said coupling member against axial displacement thereof, said spring force acting in the direction of said rotational axis between said coupling member and said first damping member;

said coupling member including axial slip surface means between said coupling member and said second damping member acting during relative rotation between said coupling member and said second damping member;

said coupling member is annular in configuration and is arranged to be axially displaceable between a pair of surfaces which are axially directed opposite to one another and which are firmly axially connected with said first damper member, said axially acting spring means being arranged axially on both sides of said coupling member between said coupling member and said surfaces;

said coupling member is arranged in an annulus which encloses said rotational axis and is sealed outwardly with said coupling member dividing said annulus into two chambers which are axially juxtaposed and wherein said annulus is filled at least partially with damping fluid with said two chambers being connected with each other through at least one throttling channel.

4,501,349

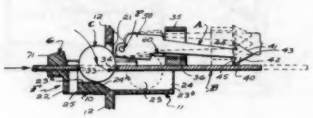
MANUALLY OPERABLE MULTI-COIN MECHANISM

Hubert M. Giepen, 1404 E. Business 83, Mission, Tex. 78572

Filed Feb. 14, 1983, Ser. No. 466,149

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—1 G **18 Claims**



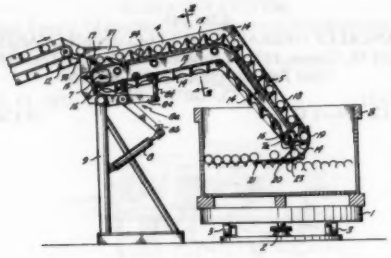
1. A coin mechanism comprising an elongate, horizontal frame with front, central and rear end portions, said frame has a mounting flange intermediate its ends and defines an elongate, upwardly and axially opening longitudinally extending channel and at least one elongate, longitudinally, rearwardly and upwardly opening coin edge receiving trough in its central portion below and between the sides of said channel; a flat, horizontal, elongate coin transport bar with front, central and rear end portions slidably engaged in the channel and manually shiftable longitudinally therein from a forward normal position to a rear actuated position, said bar has a vertical through opening in its central portion defining longitudinally spaced forwardly and rearwardly disposed coin edge engaging surfaces, said opening overlies the forward portion of the trough when the bar is in its normal position and is spaced rearward of the trough when the bar is in its actuated position; an elongate, horizontal latch arm with front and rear ends in vertical spaced substantially parallel relationship above the bar with its front end pivotally mounted to the frame on a transverse axis above the trough and the bar, said arm has upper and lower forwardly disposed latch shoulders at its rear end; said bar has vertically spaced stop shoulders normally spaced above and below the arm forward of the latch shoulders when the bar is in its normal position and spaced rearward of the latch shoulders when the bar is in its actuated position and on a substantially common transverse vertical plane with the latch shoulders when the bar is in an intermediate position; a part at the forward end portion of the arm defining an elongate, axially and downwardly opening coin edge receiving groove spaced above and opposite the rear end portion of the trough; means normally yieldingly holding the front end of the arm down relative to its pivotal axis with its lower latch shoulder positioned to establish stopped latched engagement with the lower stop shoulder when the bar is moved rearwardly to said intermediate position, said trough and groove are shaped and positioned so that upon engagement and rearward movement of a coin of predetermined thickness and diameter therein and therethrough, the coin pivots the arm upwardly so that its stop shoulders occur between vertically spaced horizontal planes between the upper and lower stop shoulders and such that if a coin which is too large in diameter and/or thickness is engaged therebetween, the coin pivots the arm upwardly so that its upper latch shoulder engages the upper stop shoulder when the bar is moved rearwardly to said intermediate position, the rear end of the bar contacts and operates a related product dispensing device when it is moved rearwardly from its intermediate position to its actuated position.

4,501,350

FRUIT-DEPOSITING MECHANISM

John E. Muller, and John E. Muller, Jr., both of Yakima, Wash., assignors to Pomona Service & Supply Co., Inc., Yakima, Wash.

Filed Mar. 18, 1982, Ser. No. 359,329
Int. Cl.³ B65G *29/00*
U.S. Cl. 198—478 **4 Claims**



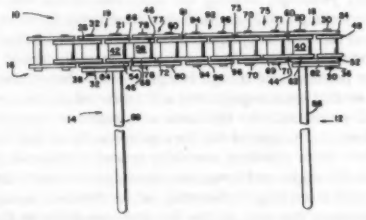
1. In a depositing mechanism, a depositing conveyor having a depending portion with a lower discharge end and including endless conveyor means extending around the depending portion of the conveyor, dividers carried by the endless conveyor means and having outer edges remote from the conveyor means and flexible sheet means bridging between the outer edges of adjacent dividers and defining between them conveying pockets, the improvement comprising divider pivot means mounting the dividers for swinging relative to the endless conveyor means about axes extending transversely of the direction of movement of the endless conveyor means, and control means for maintaining the dividers generally perpendicular to the endless conveyor means at locations remote from the lower discharge end for enabling swinging of the dividers on said divider pivot means as the dividers round the discharge end of the depending portion of the depositing conveyor for relative movement of the outer edges of adjacent dividers to reduce the distance between such outer edges below the spacing between such outer edges which would exist if both of such adjacent dividers were perpendicular to the conveyor means at the locations of their respective pivot means during travel of such dividers around such discharge end.

4,501,351

CHAIN ASSEMBLY WITH PLUG-IN MODULE

Wayne R. Tracy, Chicopee, Mass., assignor to Incom International, Inc., Pittsburg, Pa.

Filed Jan. 21, 1982, Ser. No. 341,364
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—648 **19 Claims**



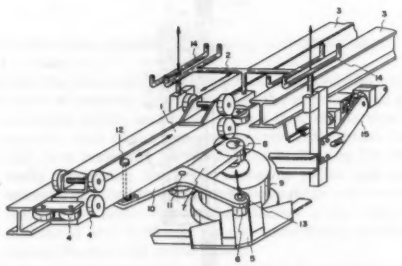
1. A chain assembly having a plurality of adjacent roller links joined together by a plurality of pin links, each pin link having a first pin plate rigidly attached to first and second pins for insertion through separate adjacent roller links and each pin link having a second pin plate for securing adjacent roller links onto said pins while allowing movement of said roller links in the plane perpindicular to the pins, wherein at least one pin link has a hollow first pin, wherein said hollow first pin has larger diameter than said second pin, and a support means inserted in said hollow first pin for supporting objects and for carrying objects along a path parallel to chain assembly movement, the support means comprising a pintle for insertion into said hollow first pin, carrying means connected to said pintle for carrying objects and the support means further comprising a module pin plate rigidly attached to the pintle for securing said pintle to the at least one pin link having the hollow first pin.

4,501,352

WORK-CONVEYING APPARATUS

Taminori Yanagisawa; Takaharu Yamaguchi, and Hiroshi Fukatsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Taiho Seiki Kabushiki Kaisha, both of Toyota, Japan

Filed Mar. 29, 1983, Ser. No. 480,035
Claims priority, application Japan, Mar. 29, 1982, 57-44233[U]
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—775 **7 Claims**



1. A work-conveying apparatus comprising:
a carriage,
a carriage guide on which the carriage slides,
a direction-regulating guide on which a slider slides, provided along the direction at a certain angle with respect to the carriage guide,
a crank provided so as to rotate centering around the intersecting point of the providing direction of the carriage and the direction-regulating guide,
a connecting link rotatably connected to the tip portion of the crank at the first pivot point, to the carriage at the second pivot point and to the slider at the third pivot point, wherein a straight line connecting the first pivot point and the second pivot point crosses, at right angle, a straight line connecting the first pivot point and the third pivot point, and the distance between the first pivot point and the second pivot point and the distance between the first pivot point and the third pivot point are both equal to the distance between the rotating center of the crank and the first pivot point.

4,501,353

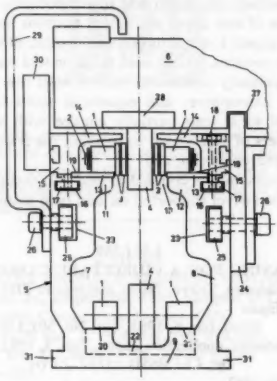
CHAIN CONVEYOR

Volker Burkhardt, Lerchenstrasse 29, 7085 Bopfigen, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,269
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148177
Int. Cl.³ B65G *17/00*
U.S. Cl. 198—779 **3 Claims**

1. A chain conveyor system adapted for continuous circula-

tion and the movement of material comprising a plurality of chain roller pairs connected together by side bars to form a continuous chain; a shaft rotatably supporting each chain roller pair, said shaft further rotatably supporting between said chain rollers a carrier roller of greater diameter than said chain rollers; a unitary support member having a generally trough-shaped cross-sectional configuration comprising two upwardly extending side members connected by a transverse base member, the upper ends of said side members being sufficiently separated so as to permit movement of said carrier rollers and said chain roller side bars therebetween; a runner track provided on the upper surface of each side member independent



from its respective side member for supportin said chain rollers in the advancing stage of said chain circulation; a runner track provided on said transverse base member for supporting said chain rollers in the returning stage of said chain circulation; a recess in said upper surface of each side member adjacent said runner track for mounting, by means cooperating with said upper surface recess, a claw member, said claw member extending over and providing a protective cover for said chain rollers and securing, by means of a shoulder member in the base of said claw member, the side member runner track to its respective side member; and longitudinal recesses in the outer side of each side member for mounting therein components associated with said chain conveyor system.

4,501,354

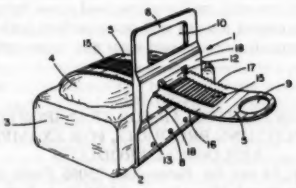
SOAP SAVING DEVICE

Edward C. Hoffman, 4 Kane Ct., Clarendon Hills, Ill. 60514

Filed May 24, 1984, Ser. No. 613,580

Int. Cl.³ A47K *5/08;* **B65D** *85/62;* **B29C** *3/00, 27/00*

U.S. Cl. 206—77.1 **11 Claims**



1. A soap saving device for pressure bonding two or more pieces of soap, comprising a base having an irregular surface serving as a support for a first piece of soap placed thereon, a flexible strap handle including first locking means integrally joined to a first side of the base, and second locking means integrally joined to a second side of the base opposite the first side with both locking means being engageable to cause the flexible strap handle to envelop together two or more pieces of soap stacked on the base to exert a pressure bonding force causing the two pieces of soap to bond to one another.

4,501,355

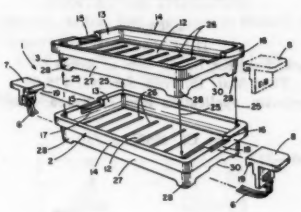
SOAP SAVING DEVICE HAVING NESTING DISHES

Edward C. Hoffman, 4 Kane Ct., Clarendon Hills, Ill. 60514

Filed May 24, 1984, Ser. No. 613,581

Int. Cl.³ A47K *5/08;* **B65D** *85/62;* **B29C** *3/00, 27/00*

U.S. Cl. 206—77.1 **10 Claims**



1. A soap saving device for pressure bonding two or more pieces of soap, comprising two separate soap dishes each having a bottom defining a soap supporting surface and each being sized and contoured so as to nest one within the other when stacked with the two bottoms being in face to face relationship, and with one dish serving as base dish and the other serving as a top dish, and means engageable between the two soap dishes exerting a force which tends to move the two soap dishes together and thus exerts a pressure bonding force on any two or more pieces of soap disposed between the two soap dish bottoms.

4,501,356

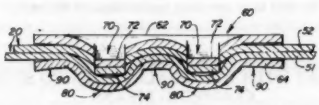
SLIP SEAL JOINT FOR STRAP

Clement A. Urban, Willow Springs, and Gale W. Huson, Glenview, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Dec. 29, 1982, Ser. No. 454,256

Int. Cl.³ B65D *71/00, 63/08, 63/16*

U.S. Cl. 206—83.5 **1 Claim**



1. In combination, the elements comprising: a bale of compressed resilient material; at least one strap with two oppositely facing major side surfaces having predetermined frictional characteristics disposed in a loop around the bale to overlap an inner end portion of the strap adjacent the bale with an outer end portion of the strap; and a seal deformed closed about both of said overlapping strap end portions with one part of said seal adjacent one of said overlapping strap end portions and with another part of said seal adjacent the other of said overlapping strap end portions, two spaced-apart regions of said one strap end portion being severed from the edge of the strap for a part of the strap width to define therebetween a deformable wall and said wall being offset from said one strap end portion to define a notch in said one strap end portion, said deformed closed seal including: (1) a seal wall offset from and relative to said one part of said seal adjacent said one strap end portion, said offset seal wall projecting into said notch in said one strap end portion to effect an interlocking engagement between said one part of said seal and said one strap end portion preventing

withdrawal of said one strap end portion from said closed seal, and (2) a crimp of said other part of said seal against said other strap end portion with a predetermined degree of frictional force engagement which, in combination with other frictional forces acting on the strap, is sufficiently great to restrain said other strap end portion relative to said seal when the tension force on said strap is equal to or less than a predetermined tension force but which is sufficiently low to permit relative movement between said overlapping strap end portions when the tension force on said strap exceeds said predetermined tension force.

4,501,357

DISK JACKET

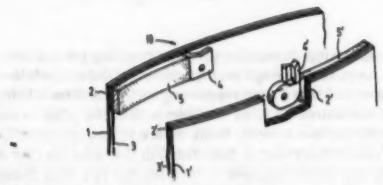
Jong S. Park, Jung-Ku, Seoul, Rep. of Korea

Filed Mar. 15, 1983, Ser. No. 475,657

Claims priority, application Rep. of Korea, Mar. 18, 1982, 2068

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—312 **10 Claims**



1. A disk jacket comprising an envelope for receiving an disk, said envelope having first and second opposed walls closed along three corresponding edges and having corresponding first and second upper edges defining an opening:

first and second normally outwardly curved elastic plates secured along the length of said first and second upper edges, respectively, of said first and second opposed walls to seaparate said walls and to hold the jacket normally open at said opening,

first and second interlocking means secured to said first and second upper edges, respectively, for holding said curved elastic plates together and thereby holding said opening closed; and

covering means secured along said first and second upper edges to seal said opening upon closure thereof.

4,501,358

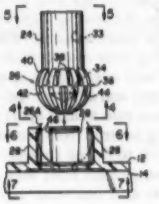
DESK SET WITH INTEGRALLY FORMED SWIVEL CLAMPING MEANS

Benson Zinbarg, 111 Chestnut Hill La., Stamford, Conn. 06903

Filed Oct. 28, 1983, Ser. No. 546,482

Int. Cl.³ B43M *17/00*; A47F *7/00*

U.S. Cl. 206—371 **6 Claims**



1. A desk set for holding desk accessories comprising:

a base member (12);

socket forming means (28) integrally molded with said base member (12) for forming a socket with resilient clamping action, said socket forming means comprising a plurality of spaced apart part-cylindrical clamping members (28) integrally projecting out of said base member (12) and inclined at their outer ends toward a central axis perpendicular to said base member;

a generally ball-shaped member (26) adapted for insertion into said socket for swivel engagement with said socket and for removal therefrom, the surface of said ball-shaped member (26) being formed with alternating substantially radially directed slots (38,42) and ridges (40,44), and a substantially equatorial mold line (36) which divides the ball surface into upper and lower portions, the slots (38) on one of said upper and lower portions being staggered with respect to the slots (42) on the other of said upper and lower portions, so that each ridge on said one portion is at least partially continuous with at least one ridge on said other hemisphere, said equatorial mold line being arranged to at least partially engage with said clamping members of said socket to increase the frictional engagement therebetween; and

an accessory means coupled to said ball-shaped member so as to be swivel supported on said base member.

4,501,359

CASING FOR A VIDEO TAPE CASSETTE

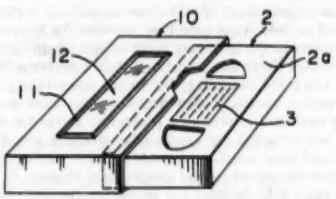
Keiichi Yoshizawa, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,116

Claims priority, application Japan, Jun. 7, 1982, 57-84470[U]

Int. Cl.³ B65D *85/67, 27/04*

U.S. Cl. 206—387 **4 Claims**



1. A videotape cassette and casing combination comprising:

a videotape cassette having a label on one surface thereof;

a casing for said videotape cassette, said casing having a face including inner and outer surfaces and a window in said face at a position corresponding to said label when said cassette is introduced into said casing; and

a transparent film cover for said window, said transparent cover being attached to said inner surface of said casing face and covering said window, said cover being formed so as to extend toward said outer surface such that said cover extends between said inner and outer surfaces.

4,501,360

PACKING, IN PARTICULAR FOR TRANSPORTING AND DISPATCHING PRODUCTS, FOR EXAMPLE BIOLOGICAL PRODUCTS

Claude Levy, 14 rue des Bernardins, 75005 Paris, and Jean-Philippe Duchesne, 10 rue Manin, 75019 Paris, both of France

Filed Apr. 19, 1984, Ser. No. 602,075

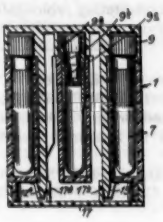
Claims priority, application France, Apr. 27, 1983, 83 06902

Int. Cl.³ B65D *85/42, 1/24*

U.S. Cl. 206—443 **8 Claims**

1. A packing, in particular for transporting and dispatching products, for example biological products, said packing comprising a case body subdivided into suitably calibrated receiving cavities, containers for the products to be transported

disposed in said cavities, at least a cover having an internal profile capable of fitting on said case body and so shaped as to cooperate with said case body, said internal profile being capable of individually immobilizing said containers in said cavities under axial compression of said containers and rendering said



cavities fluidtight, even in the event that said containers become broken inside said cavities, and detachable locking means for temporarily locking said cover to said case body, said locking means being inaccessible in the course of transportation of said packing.

4,501,361

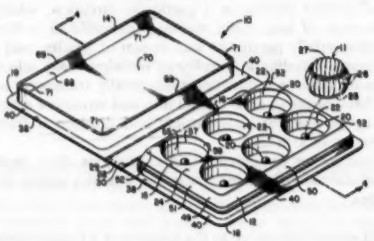
PRINTER THIMBLE ELEMENT HOLDER

Robert D. Rose, Jr., Englewood, Colo., assignor to Communications Packaging Corporation, Denver, Colo.

Filed Feb. 1, 1984, Ser. No. 575,899

Int. Cl.³ B65D *1/36, 25/10, 85/30*

U.S. Cl. 206—493 **3 Claims**



1. A storage case for thimble elements used in printing devices comprising in combination:

a front cover hingeably connected through a spine to a back cover, said back cover having a flat inner surface on which said inner surface is connected a thimble element tray including a plurality of upwardly directed spindles formed in rows and columns thereon for releasably retaining and protecting therein at least one of said thimbles, each of said spindles formed about a longitudinal axis, an open element well associated with each of the spindles having a circular bottom surface formed in a generally flat planar top surface of said tray concentric with said spindle axis, each of said wells including a slightly diverging surface extending upwardly away therefrom and a cylindrical surface, said well adapted to matingly conform to the thimble elements, said cylindrical surface terminating at said top surface, an outer periphery of said top surface terminating in a continuous sloping guide surface extending outwardly and downwardly from said top surface around the periphery of the top surface, the guide surface defining an angle of approximately fifty-five degrees with said flat inner surface and terminating in a mating surface and a stop ledge extending completely around the periphery of said tray, said front cover having an inner surface on which is connected a tray cover defined by an outside and inside wall extending upwardly therefrom and interconnected by an engagement ledge, said tray cover defining a recess for receipt of said element tray, said edge of said tray cover adapted to engage said element tray guide surface upon closure of said tray cover over said tray, thereby automatically aligning the front cover relative to the back cover on closure of the case.

4,501,362

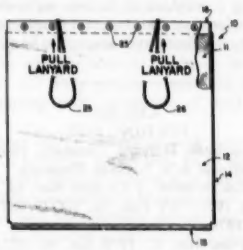
APPARATUS AND METHOD FOR COMPRESSING A SLEEPING BAG INTO A CONTAINER AND THE CONTAINER THEREFOR

James W. Duncan, Arden, N.C., assignor to Stencel Aero Engineering Corporation, Arden, N.C.

Filed Apr. 29, 1982, Ser. No. 373,149

Int. Cl.³ B65D *85/16*

U.S. Cl. 206—525 **10 Claims**



1. A container for a compressed sleeping bag, the combination comprising:

a first planar, rectangular member having depending flanges on two sides and an end;

a second planar, rectangular member having depending flanges on two sides and an end;

hinge means, coupled to said end flanges of said first and second members, for hingedly coupling said first and second members; and

closure means, coupled to said first and second members, for releasably coupling said first and second members in a closed position against the force of the compressed sleeping bag contained therein,

said closure means including

a first bar rigidly coupled to said first member at the other end thereof,

a second bar rigidly coupled to said second member at the other end thereof,

frangible means, coupled to said first and second bars, for preventing separation thereof, and

a lever rigidly coupled to said frangible means for breaking said frangible means upon pivotal movement thereof relative to said first and second members to allow separation thereof.

4,501,363

SURGICAL KIT

Edward K. Isbey, Jr., 407 Vanderbilt Rd., Asheville, N.C. 28803

Filed Oct. 25, 1983, Ser. No. 545,211

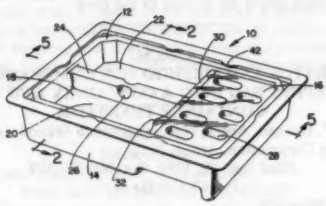
Int. Cl.³ B65D *85/62, 81/36*

U.S. Cl. 206—570 **15 Claims**

1. An improved surgical kit comprising:

first and second trays, each having side walls and a bottom, at least a portion of the bottom of each tray having a raised portion including a plurality of embossments forming recesses therein receiving various medical supplies, the bottoms of said first and second trays each having a deep pan portion separate from said raised portion for receiving various articles, said deep pan portion in each

tray displacing a larger volume than said embossments in the bottom of said respective first and second trays; said first tray having a lip extending away from its side walls about the outer periphery of said first tray; said second

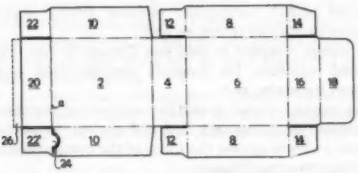


tray having a shoulder on its side walls about the inner periphery of said second tray, said shoulder receiving said lip whereby said first tray is adapted to be mounted on said second tray.

4,501,364
FOLDING BOX

Heinrich W. Lambach, Horsens, Denmark, assignor to Brdr. Schur International A/S, Horsens, Denmark

PCT No. PCT/DK79/00007, § 371 Date Nov. 13, 1979, § 102(e) Date Nov. 13, 1979, PCT Pub. No. WO79/00740, PCT Pub. Date Oct. 4, 1979
PCT Filed Mar. 12, 1979, Ser. No. 297,694
Claims priority, application United Kingdom, Mar. 10, 1978, 9601/78
Int. Cl.³ B65D *5/70*
U.S. Cl. 206—626 **4 Claims**

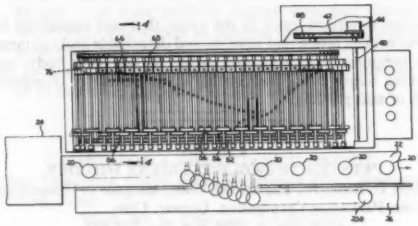


1. A blank for erecting a reclosable box of the type having an openable end flap hinged at one edge to a rear panel of the box and provided at an opposite edge with a free holding flap which, when the end flap is closed, is tucked inside a front panel of the box and in which opposed side panels of the box are provided with flap extensions folded inwardly as inner corner flaps disposed inside the end flap, the box further comprising a pair of outer side panels, each of which overlies and is secured to a respective one of said opposed side panels and has a respective flap extension which is folded in along a fold line over end flap to form an additional corner flap, and a cover flap forming an extension of the front panel and folded over along a fold line to overlie the additional corner flaps and the end flap, and wherein the cover flap is secured to the additional corner flaps, and the cover flap and the additional corner flaps are removable together by rupturing the said fold lines to expose the end flap and permit its being opened, and in which the side panels are narrower than the front and rear panels, and wherein the front and rear panels are folded up from opposite edges of a bottom panel opposite the end flap and are each provided along opposite edges with extension which in the erected box constitute the said opposed side panels and the said outer side panels, said blank comprising panel portions defining the bottom panel, front panel, rear panel, opposed side panels, corner flaps on the side panels and end flap on the rear panel, as well as the cover flap on the front panel, for said box, and wherein the front and rear panels are connected with opposed edges of the bottom panel, and side panels are provided at both sides of the rear panel and front panel, respectively, these side panels each having a corner flap projecting from adjacent ends thereof, the corner flaps of the side panels belonging to the front panel being connected with those side panels through lines of weakness constituting prolongations of a line of weakness between the front panel and the cover flap.

4,501,365
TRANSFER SYSTEM

John J. Peyton, and Bryan K. Watt, both of Santa Barbara, Calif., assignors to Industrial Automation Corp., Goleta, Calif.

Filed Oct. 26, 1981, Ser. No. 314,780
Int. Cl.³ B07C *5/36*; B65G *47/46*
U.S. Cl. 209—548 **38 Claims**



1. A selective transfer system comprising

a continuous chain means for disposition adjacent a stream of articles moving in a particular direction, whereby a portion of said chain means is movable in a direction substantially parallel to said stream of articles, said chain means including a plurality of transfer means selectively projectable in a direction substantially transverse to said chain means so as to extend into said stream of articles to engage any particular article and displace it from the stream of articles

second means for driving said continuous chain means at substantially the same linear speed as the stream of articles,

and

third means responsive to the location of a transfer means at the time an article decision signal is generated to control the transfer means, when the specific article reaches the transfer means, to extend one or two transfer means to engage the particular article and displace it from the stream of articles, said third means being a means for extending one transfer means if said transfer means will engage the approximate center of the particular article to be displaced, and for extending two transfer means to engage the particular article on opposite sides of the center thereof if one transfer means is not extendable to engage the approximate center of the particular article.

4,501,366
PHOTOMULTIPLIER TUBE ASSEMBLY

Roger A. Thompson, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 14, 1982, Ser. No. 449,764
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—556 **16 Claims**

10. A high speed light testing apparatus for continuous testing of one piece can body members having a sidewall portion, and a bottom wall portion at one end defining a container cavity, and an opening at the other end, and a formed flange portion at the other end surrounding the opening for subsequent association with a can closure member; the machine being adapted for testing the can body member for defects

including pin holes in the sidewall portion and the bottom wall portion, and unwanted deformation and cracks in the flange portion, the apparatus comprising:

frame and housing means for supporting and housing the machine components;

horizontally extending rotatable shaft means rotatably supported by said frame and housing means and providing a central axis of rotation;

motor means for causing continuous rotation of said rotatable shaft means;

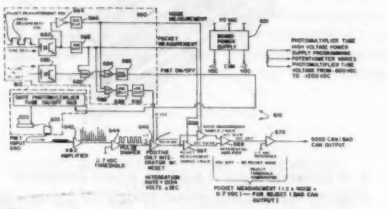
can body member transfer wheel means mounted on said shaft means for rotation therewith and for carrying can body members in a circular path thereabout;

a plurality of pocket means circumferentially spaced about the outer periphery of said transfer wheel means for receiving a can body member in each pocket means and for transferring each can body member along said circular path during a portion of each revolution of said transfer wheel means;

in-feed means mounted on said frame and housing means for loading one can body member in each of said pocket means during each revolution of said transfer wheel means;

light applying means for applying light to the exterior surfaces of each can body member in each of said pocket means, the light applying means being non-rotatably mounted relative to said transfer wheel means and located to provide a continuous light zone during each revolution of said transfer wheel means;

discharge chute means for receiving defective can body



members from said transfer wheel means during each revolution of said transfer wheel means;

unloading chute means for receiving non-defective can body members from said transfer wheel means during each revolution of said transfer wheel means;

extendable and retractable means mounted on said shaft means for rotation therewith and being associated with each of said pocket means for axially moving a can body member in each of said pocket means between a first retracted position and a second extended position during a portion of each revolution of said transfer wheel means;

releasable holding means associated with each of said extendable and retractable means for abutting and releasable holding engagement with the bottom wall portion of a can body member in each of said pocket means during a portion of each revolution of said transfer wheel means;

sealing means mounted on said shaft means for rotation therewith and being associated with each of said pocket means and each of said extendable and retractable means for engagement with the flange portion of non-defective can body members carried in each of said pocket means and releasably held by said holding means, the holding means, being operative to effect holding engagement with the bottom wall of said can body member and the extendable and retractable means being operative from the first retracted position to the second extended position to effect sealable engagement of the flange portion of each can body member with the associated sealing means prior to movement of each can body member to said light zone;

light detection means non-rotatably mounted relative to said transfer wheel means and being located for successive axial alignment with each of said pocket means and the opening in the can body member carried thereby opposite said sealing means in the light zone for receiving light only from said light applying means through the can body member and between the flange portion and the sealing means and for generating a control signal upon receipt of light therefrom;

said extendable and retractable means being operative from the second extended position to the first retracted position to retract each can body member from sealable association with said sealing means after movement beyond said light detection means prior to reaching said discharge chute means during each revolution of said transfer wheel means;

defective can body member release control means effective in response to said control signal from said light detection means for releasing each defective can body member before reaching said discharge chute means during each revolution of said transfer wheel means;

non-defective can member release control means effective as each non-defective can body member approaches said unloading chute means for releasing each non-defective can body member and for enabling discharge of non-defective can body members into said unloading chute means during each revolution of said transfer wheel means;

pressurization means associated with each of said sealing means for applying pressurized air to said sealing means for obtaining minimal sealing area engagement between said sealing means and the flange portion of said can body members and for applying pressurized air through the opening to the interior of said can body member to outwardly flex the side wall portion and the bottom wall portion to enhance the passage of light through openings therein;

rotational speed monitoring means for monitoring the speed of said rotatable shaft means and providing a speed monitor signal; and wherein said light detection means comprises:

a photomultiplier tube assembly for use in high speed light testing apparatus for making a series of light measurements in rapid succession during light-test periods wherein each light-test period is followed by a noise-test period, said light-test periods and noise-test periods being spaced apart in time by interval periods, the beginning of said light-test periods and said noise-test periods being determined by the physical orientation of certain moving parts of said high speed light testing apparatus with respect to certain fixed parts of said apparatus, said photomultiplier tube assembly comprising:

(a) photomultiplier tube means operably mounted to receive light during light-test periods and to be shielded from light during noise-test periods for generating a photomultiplier tube electrical signal having a value proportionate to the light received by the said photomultiplier tube means;

(b) photomultiplier tube switching means for switching said photomultiplier tube means on and off operably synchronized with said testing apparatus whereby said photomultiplier tube means is switched on during said light-test periods and said noise-test periods and switched off during said interval periods;

(c) measuring circuit means for measuring said photomultiplier tube signal and generating a measuring signal responsive thereto;

(d) timing means for dividing said measuring signal into a light-test measurement signal and a noise-test measurement signal, said light-test measurement signal corresponding to the portion of said measuring signal associated with said light-test period and said noise-test measurement signal corresponding to the portion of said measuring signal associated with said noise-test period; and

(e) comparator circuit means for comparing said light-test measurement signal with said noise-test measurement signal and generating a control signal in response to said comparison;

said timing means comprising:

monitor means for sensing the occurrence of said light test periods and said noise-test periods as a function of the alignment of predetermined physical parts of said high speed testing apparatus with said photomultiplier tube means and generating a monitoring signal in response to said machine light-test alignment position and said machine noise-test alignment position;

said monitor means comprises:

encoder means operably mounted on said high speed light testing apparatus for generating an encoder signal;

clock signal generating means for receiving said encoder signal and generating a square wave clock signal in response thereto; said clock signal having a light-test portion associated with the machine light-test alignment position and a noise-test portion associated with the machine noise-test alignment position; said light-test portion and said noise-test portion of said clock signal being of opposite polarity;

said timing means further comprising:

first time pulse generating means for generating a first time pulse signal of predetermined duration in response to said light test portion of said clock signal;

second time pulse generating means for generating a second time pulse signal of predetermined duration in response to said noise test portion of said clock signal;

the length of said first and second time pulse signals defining the length of said light-test period and said noise-test period, respectively;

first measuring signal sample and hold means for sampling said measuring signal during a period of enablement and holding said measured sample and generating a first sample signal proportionate thereto until the next period of enablement, wherein said first measuring signal sample and hold means is enabled by said first time pulse signal for the duration of said first time pulse signal; and

second measuring signal sample and hold means for sampling said measuring signal during a period of enablement and holding said measured sample and generating a second sample signal proportionate thereto until the next period of enablement, wherein said second measuring signal sample and hold means is enabled by said second time pulse signal for the duration of said second time pulse signal.

4,501,367

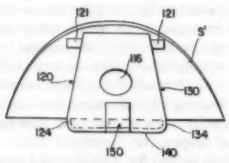
STANDS FOR SUPPORTING FOOD SHELLS DURING PREPARATION AND CONSUMPTION

C. P. Potts, 3201 McEvoy Dr., Macon, Ga. 31206

Filed Aug. 29, 1980, Ser. No. 182,488

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—13 **8 Claims**



1. A taco holder for supporting a fillable taco shell, comprising:

bowl means having a generally flat and smooth base, a smooth and generally cylindrical flexible side wall and an axis of concentricity normal to said bottom,

said bowl means including means for supporting the taco shell in an upright position and normal to the axis of concentricity, and comprising at least one generally smooth U-shaped cut in the side wall of said bowl means, the legs of the U extending upwardly and in a diverging outward direction from the bottom of the U, and the cylindrical side wall below the height of the bottom of the U extending upwardly from said base; and

stabilizing lip means for stabilizing said bowl on a supporting surface, said stabilizing lip means being at the base of said bowl means and extending outwardly therefrom.

4,501,368

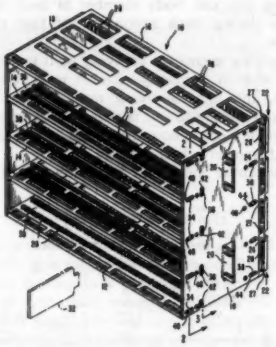
SUBSTRATE SUPPORT MODULE

Daniel G. Gill, Greensboro, N.C., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,500

Int. Cl.³ A47G *19/08*

U.S. Cl. 211—41 **11 Claims**



1. A substrate support module, which comprises:

at least one essentially planar guide shelf having guide means for guiding an edge of a substrate when the substrate is inserted into the substrate support module;

a pair of side support members located adjacent respective opposite ends of the guide shelf for supporting the shelf;

a series of at least three locating projections extending from at least one end of the guide shelf for mounting the shelf on the side support member which is adjacent the one end of the shelf; and

the side support member adjacent the one end of the guide shelf having a set of at least three spaced elongated locating slots formed therein, the projections on the guide shelf being received in respective ones of the elongated slots in closely spaced relationship by opposed walls of the slots and in spaced relationship to opposite ends of the slots, with two of elongated slots extending parallel to the guide shelf and the remaining slot extending perpendicular to the guide shelf.

4,501,369

MERCHANDISE DISPLAY MEANS

Clifford R. Fox, Chelmsford, England, assignor to CBM Display Group Limited, Woodford Green, England

Filed Dec. 15, 1981, Ser. No. 331,215

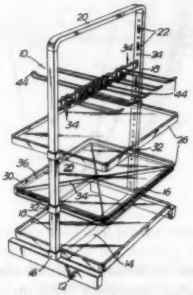
Claims priority, application United Kingdom, Dec. 23, 1980, 8041115

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—133 **4 Claims**

1. A merchandise display assembly comprising at least one elongate support member which is upright when in use, merchandise retaining means supported by said at least one elongate support member, tubular engagement means of said merchandise retaining means at an edge thereof through which

tubular engagement means extends said elongate support member to allow the merchandise retaining means to be slid up and down said elongate support member, locating means which is generally U-shaped and also wedge shaped, engagement means of said locating means to allow the latter to engage said elongate support member selectively at any one of a number of different heights, said tubular engagement means of said merchandise retaining means resting on said locating means when



the assembly is in use, and two arms of said locating means, being the two arms of the "U", which extend in substantially the same direction as one another and which embrace said elongate support member when said locating means engages said elongate member, and positively grip the latter owing to a wedging action brought about by said engagement means of said merchandise retaining means resting on said locating means when the assembly is in use.

4,501,370

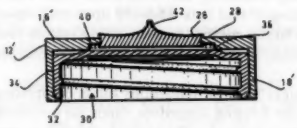
MEDICINE BOTTLE CLOSURE HAVING AN INDICATOR

John A. Kelley, Rte. 2, Box 21C, Lexington, Tenn. 38351

Filed Aug. 5, 1982, Ser. No. 307,864

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—219 **5 Claims**



5. A top for a pill or other medicine bottle, said bottle having an externally threaded upper portion which receives the top, said top comprising:

cover means including a first member having a first section which is substantially circular in cross-sectional outline and defining an upper surface, and a further section having a depending portion which flexes when squeezed, and a further member which is rotatably mounted within said first member and includes an internal surface which is externally threaded for purposes of receiving the externally threaded upper portion of said bottle, said further member being rotated for purposes of opening said bottle by squeezing said flexible depending portion of said first member such that said first member and further member frictionally engage, said first section of said first member defining an opening including a mouth which circumscribes said opening;

a plurality of indicia provided on said upper surface of said first member serving to indicate the time at which the next dosage of medicine contained within said bottle is to be taken; and

A dial member including an annular perimeter which defines a recess that receives said mouth of said first member whereby said dial member is rotatably mounted in said opening in said first member, said dial member having an indicator which is moved by the user to be aligned with one of said indicia to indicate the time when the next dosage of medicine contained in said bottle is to be taken.

4,501,371

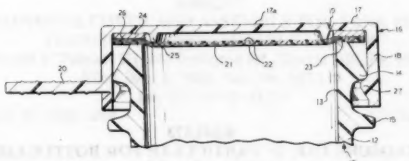
TAMPER INDICATING, NON-RESEALABLE CLOSURE

Ned J. Smalley, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 5, 1983, Ser. No. 558,141

Int. Cl.³ B65D *41/48*

U.S. Cl. 215—232 **16 Claims**



1. A non-reusable tamper indicating package comprising

a container having a body portion and a neck portion defining an opening,

said neck portion having an annular bead spaced from the end of the neck,

a closure having a top wall and a peripheral skirt,

said closing having a retention and lacking bead on the skirt thereof adapted to engage the annular bead on the container,

said closure including spaced score lines on the skirt and a portion of the top wall such that when the portion of the skirt between the score lines is pulled outwardly and upwardly, the closure is severed along the score lines,

a foil sheet having a layer of thermoplastic material on each surface thereof thermally bonded to the upper end of the container,

said top wall having a depending portion thermally bonded to the thermoplastic material on the foil sheet such that when the portion of the skirt and top wall are severed along the score lines the depending portion tears the foil sheet to provide access to the contents and the foil sheet can not be reused and the closure can not be reused to reseal a container.

4,501,372

TEAR-OPEN CLOSURE FOR A CONTAINER

Gerhard Hansen, Heerstrasse 20, 7166 Sulzbach-Laufen 2, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,815

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 3310265

Int. Cl.³ B65D *51/00*

U.S. Cl. 215—247 **15 Claims**

1. A tear-open closure for a container, comprising:

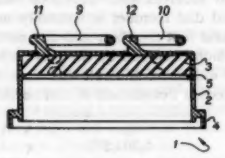
a cap of thermoplastic material having a top wall with upper and lower surfaces and a side wall depending from said top wall;

first and second mutually exclusive top parts defined in said top wall by scored parts of reduced thickness, said scored parts formed by grooves arranged as curves;

first and second grips coupled to said first and second top parts, respectively; and

a gasket extending within and against said side wall and

against said lower surface of said top wall such that said gasket completely underlies all of said top parts and keeps



the container closed upon removal of said top parts, said gasket having at least first and second puncture points within said first and second top parts, respectively.

4,501,373

CLOSURE CAP, IN PARTICULAR FOR BOTTLE-LIKE CONTAINERS, HAVING AN ELEMENT ASSURING INTACTNESS

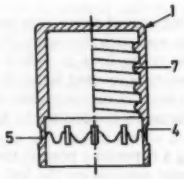
Hans Heinlein, Dombühlstrasse 33, D-8801 Schillingsfürst, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,752

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233805

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **11 Claims**



1. A closure cap, in particular for bottle-like containers, having an element assuring intactness which is connected by tear strips with a cap portion and remains on the container after the closure has been opened for the first time by tearing the tear strips, characterized in that a separation seam separates said element assuring intactness from said cap portion, said seam comprising a repeating waveform-shaped weakening in a wall of the cap disposed between the cap portion and the element assuring intactness, the edge of said cap portion adjacent said weakening including a first set of oppositely directed segments, the edge of said element assuring intactness adjacent said weakening including a second set of oppositely directed segments, and said tear strips being carried by said cap between, and releasably interconnecting, said element assuring intactness and said cap portion, said first and second sets of segments meshing with one another, when said cap is rotated in a first container capping direction, for coupling said cap portion unitarily with said element assuring intactness during capping of said container, said first and second sets of segments meshing with one another, when said cap is rotated in a second direction opposite to said first direction, for uncoupling, by separating, said cap portion from said element assuring intactness by stretching and then tearing said tear strips.

4,501,374

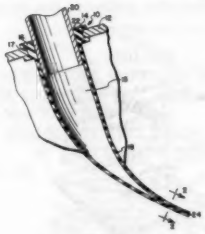
HAZARDOUS FLUID TANK WITH CHECK VALVE

S. Harry Robertson, 1024 E. Vista Del Cerro, Tempe, Ariz. 85281

Filed Feb. 10, 1983, Ser. No. 465,634

Int. Cl.³ B60K *15/04, 15/08;* **B65B** *39/02;* **B65D** *25/20*

U.S. Cl. 220—86 R **12 Claims**



1. A safety tank for hazardous fluids comprising:

a tank for holding hazardous fluids on a vehicle;

an opening formed in the wall of said tank to provide access to the interior of said tank;

inlet filling means separably mounted on said tank at said opening to direct fluid into said tank interior, said filling means being vulnerable to separation from said tank upon occurrance of an accident involving the vehicle;

a tubular resilient check valve allowing fuel to pass into said tank from said filling means while blocking the path of fuel from said tank, said check valve comprising an elongated resilient tube normally collapsed at a distal end of said valve so that fluid passing through said filling means expands said tube for fluid passage into said tank and said tube collapses when fluid ceases to flow therethrough thereby preventing fluid from escaping from said tank; and

mounting means separable from the separable mounting of said inlet filling means and interconnecting said inlet filling means with said check valve, said mounting means fixedly mounting said check valve to said wall at said opening of said tank whereby upon said separation of said inlet filling means, said mounting means remains fixedly mounted to said tank to prevent fluid escaping from said tank.

8. A safety tank for hazardous fluids comprising:

a tank for holding hazardous fluids on a vehicle;

an opening formed in the wall of said tank to provide access to the interior of said tank;

an annular grommet sealingly engaging and fixedly secured to the perimeter of said opening in said wall, said grommet being adapted to sealingly receive an annular filler pipe to direct fluid to said tank interior;

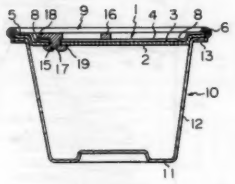
an annular filler pipe sealingly and separably seated in said grommet to act as a conduit to direct fuel into the interior of said tank, said pipe being vulnerable to separation from said grommet upon occurrance of an accident involving the vehicle; and

a resilient check valve sealingly attached to said grommet to allow fluid to pass from said filler pipe into said tank, said check valve comprising an elongated resilient tube in fluid communication with said grommet, said tube normally being collapsed at a distal end of said valve so that fluid passing through said filler pipe expands said tube for fluid passage into said tank and said tube collapses when fluid ceases to flow therethrough thereby preventing fluid from escaping from said tank upon said separation of said pipe from said fluid grommet.

4,501,375
EASILY-OPENABLE HEAT-SEAL LID

Tadahiko Katsura, Yokohama; Kazumi Hirota, Tokyo, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,542
Claims priority, application Japan, Feb. 15, 1983, 58-21990
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 9 Claims

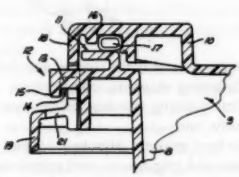


1. An easily-openable heat-seal lid for forming a heat-sealed portion with a vessel proper for sealing the vessel proper, which is composed of a laminate comprising at least an inner surface member of a heat-sealable resin, a metal foil and an outer protecting layer, wherein a score defining a portion to be opened is formed at a part of the lid more central than the peripheral portion to be heat-sealed so that the score extends to the midway of the metal foil in the thickness direction from the outer side, a through hole piercing through the lid is formed on the inner side of the score in the vicinity of the opening-initiating portion of the score, a rivet of an opening tab, which is composed of the inner surface member material and a heat-sealable resin, is inserted through the hole to project to the inner surface side of the lid, the top end portion of said projection of the rivet is expanded in the plane direction to secure the opening tab, the top end portion of the rivet projected on the inner surface side is sealed and engaged with the inner surface member by heat fusion bonding, and one end portion of the opening tab or the peripheral portion of the inner surface side of the rivet is substantially superimposed on the opening-initiating portion of the score.

4,501,376
CONTAINER AND CLOSURE HAVING LUG FASTENING MEANS

Maxwell J. Bushby, Marrickville, Australia, assignor to Commonwealth Moulding Pty. Limited, New South Wales, Australia

Filed Nov. 22, 1983, Ser. No. 554,243
Claims priority, application Australia, Dec. 15, 1982, PF7277
Int. Cl.³ B65D *41/06, 41/36*
U.S. Cl. 220—298 5 Claims

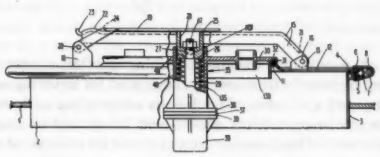


1. A pail of the kind consisting of an open-top body and a lid applicable to the open-top; comprising:
(a) an annular seating which defines said open-top;
(b) a circumferential array of evenly-spaced cantilever clamping lugs on said body, disposed adjacent but below said seating and extending radially from said body to a greater extent that does said seating;
(c) a socket groove formed in the underside of said lid so to open directly above said seating when the lid is applied to the body;
(d) a skirt which depends from the periphery of said lid thereby to encircle and extend below said seating and below said lugs when the lid is applied to the body;
(e) a bottom portion of said skirt of greater diameter than the remainder of said skirt;
(f) locking apertures formed in said skirt to extend circumferentially thereof in correspondence with the number and spacing of said lugs, each having one end partly formed in said bottom portion thereby freely to admit one of said lugs into said aperture, and its other end formed as a restriction able to take hold of a lug admitted into said aperture; and
(g) a resilient sealing ring housed in said groove and brought to bear against said seating when said lugs are held within said apertures.

4,501,377
MANHOLE COVER AND ASSEMBLY FOR TANK FOR TRANSPORTING FLAMMABLE LIQUIDS

Donald F. Palmer, III, 443 Irvington Rd., Drexel Hill, Pa. 19026

Filed Dec. 1, 1983, Ser. No. 557,118
Int. Cl.³ B65D *45/28*
U.S. Cl. 220—314 12 Claims



1. A manhole cover and assembly for a mobile tank for transporting flammable liquids, said cover adapted to provide protection against explosion during emergency conditions, said cover and assembly comprising:
A. means for permitting limited controlled movement of said manhole cover in the opening direction in response to low-rate build-up of fluid pressure in said tank to allow pressure-reducing venting and for returning said cover to fully closed position following venting; and
B. means for preventing opening movement of said cover in response to sudden and large pressure surge against said cover resulting from tank rollover or other emergency conditions;
C. said means for permitting limited controlled movement of said cover is the opening direction in response to low-rate build-up of fluid pressure in said tank indluding:
a. A cylinder connected to said cover and extending downwardly therefrom, said cover having an opening, said cylinder having a closed bottom and an open top and being coaxially aligned with said cover opening;
b. A piston in a lower portion of said cylinder;
c. A first chamber below said piston, said chamber containing non-compressible liquid;
d. An interior cover within and secured to said cylinder above said piston, said interior cover forming a second chamber above said piston;
e. A passageway through said piston providing communication for said liquid between said first and second chambers;
f. A fixed member extending across and above said manhole cover; and
g. A main compression spring in said cylinder positioned between said interior cover and said fixed member whereby in response to build-up of fluid pressure in said tank said manhole cover starts to lift thereby pulling up said cylinder and interior cover and compressing said

main compression spring, said upward movement of said cylinder causing said liquid to flow through said passageway from said first to said second chamber, said main compression spring returning said cylinder and manhole cover to closed position following reduction in said fluid pressure.

4,501,378

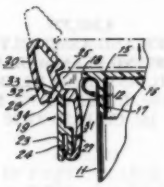
RESILIENT DETENTED LID LATCH

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Continuation-in-part of Ser. No. 449,777, Dec. 14, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,094

Int. Cl.³ B65D *45/16*

U.S. Cl. 220—324 **25 Claims**



1. A container having an opening and flange means projecting outwardly from said opening, a lid for covering said opening, and a plurality of latch units cooperating with said flange means to operatively secure said lid to said container; said plurality of latch units mounted to said lid and spaced along the edge thereof; each of said latch units including cage means fixedly mounted on said lid, and latch means pivotally mounted to said cage means; said cage means including a wall section spaced outward of a sidewall of said container and having an upper edge; said latch means including a pivot forming lower section, a manually engageable upper section, and an intermediate section between said upper and lower sections; said upper section projecting above said upper edge and said intermediate section disposed between said wall section and said sidewall; means defining a horizontal axis at said lower section about which said upper section is movable between an inner container holding position and an outer container releasing position; said upper section defining a recess in which said flange means is entered when said upper section is in said holding position; said upper section also including a formation that cooperates with said upper edge to define detent means for releasably maintaining said upper section in said releasing position.

4,501,379

NEWSPAPER DISPENSING APPARATUS

William Halone, 25545 Rice Rd., and James R. Davis, 25575 Rice Rd., both of Sweethome, Oreg. 97386

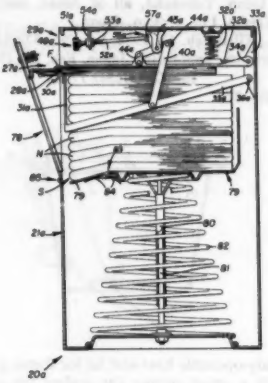
Filed Jun. 20, 1983, Ser. No. 505,748

Int. Cl.³ B65H *3/26*; G07F *11/14*

U.S. Cl. 221—221 **31 Claims**

31. In a dispensing apparatus having first and second members defining a dispensing opening therebetween for individually dispensing a newspaper, magazine, or like article from a stack of articles, the improvement comprising

adjustment means for simultaneously moving said first and second members towards or away from each other to selectively narrow or widen said dispensing opening to accommodate articles having varied thicknesses, said first member comprising a table having a stack of folded articles thereon and said second member comprising a gate disposed transversely relative to said table at a forward end thereof, said dispensing opening being defined between a lower edge of said gate and an upper side of the forward end of said table.



4,501,380

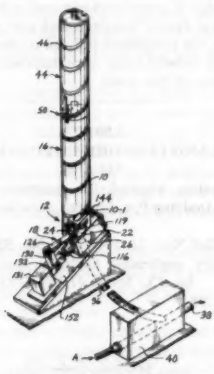
SPIRAL FEEDER FOR HEADED FASTENERS

Alfred F. Welch, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 431,251

Int. Cl.³ B65G *11/06*

U.S. Cl. 221—298 **14 Claims**



1. A spiral feeder assembly for storing and delivering headed fasteners to a fastening machine, comprising:

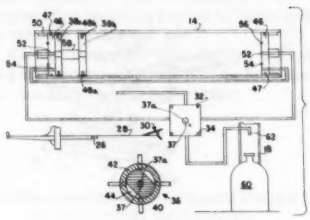
gate means for releasing one headed fastener at a time from said assembly; and:

a cylindrical feed column attached to and extending upwardly from said gate means, said cylindrical feed column having a helical delivery channel for holding a series of said headed fasteners with all fasteners being oriented in substantially the same manner for delivery to said gate means, said helical delivery channel extending along and within the surface of said cylindrical feed column to provide a downwardly extending spiral passage for delivery of said headed fasteners to said gate means with said headed fasteners being movable along said spiral passage solely by the force of gravity.

4,501,381
PURIFIED WATER DISPENSING MACHINE

John E. Hart, 1614 N. Missouri Ave., Largo, Fla. 33540

Filed Apr. 27, 1983, Ser. No. 489,120
Int. Cl.³ B67D 5/10
U.S. Cl. 222—2 10 Claims

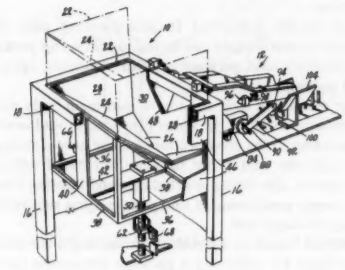


1. A water dispensing machine, comprising,
a first elongate fill tube member,
a second elongate fill tube member,
a first piston member slideably mounted interiorly of said first fill tube member and reciprocable therein between a first and second position,
a second piston member slideably mounted interiorly of said second fill tube member and reciprocable therein between a first and second position,
first inlet means for admitting water into a first end of said first fill tube member to displace said first piston member from its first position to its second position,
second inlet means for admitting water into a first end of said second fill tube member to displace said second piston member from its first position to its second position,
first outlet means for discharging previously admitted water from a second end of said first fill tube member responsive to the displacement of said first piston member,
second outlet means for discharging previously admitted water from a second end of said second fill tube member responsive to the displacement of said second piston member,
a unidirectional indexing means for sequentially and alternatingly activating said first and second inlet and outlet means,
said indexing means comprising a four-way valve member for sequentially directing water to the first inlet means of said first fill tube member, to the second inlet means of said second fill tube member, to the outlet means of first fill tube member and to the outlet means of said second fill tube member,
a coin accepting means for mechanically activating said indexing means attendant each acceptance by said machine of a preselected value of coins,
a rotatably mounted plate member,
said plate member having a plurality of four equidistantly spaced pin members projecting therefrom,
an elongate flexible rod member adapted to abuttingly engage said pin members in sequence responsive to sequential acceptance by said machine of coins, and to rotate said plate member an equal angular amount each rotation,
and said four-way valve member conjointly rotatable with said plate member,
whereby a predetermined volume of water is dispensed from said first and second fill tube members responsive to each acceptance of coins by said machine.

4,501,382
APPARATUS FOR DISPENSING MOLLUSKS

Robert van Twuyver, 258 High St., Ipswich, Mass. 01938

Filed Nov. 23, 1982, Ser. No. 443,905
Int. Cl.³ B65G 65/38
U.S. Cl. 222—63 9 Claims

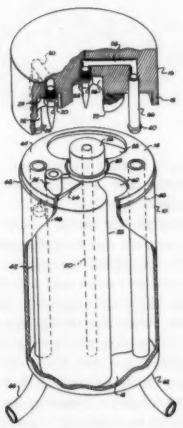


1. An apparatus for dispensing mollusks in a single file, comprising a hopper assembly including a hopper having a rigid stationary front wall formed with an outlet and movable rigid side and rigid rear walls and adapted to contain a quantity of mollusks, means including an inclined chute for dispensing mollusks in a single file, the chute having an upper end to which mollusks are supplied from the outlet of the hopper and a lower discharge end adapted to dispense the mollusks to a processing device, a prime mover, a crank having a variable throw and driven by the prime mover, and a connecting rod linking the crank to the underside of the chute.

4,501,383
HOUSING FOR A PRESSURIZED SYRUP PACKAGE

Frank M. Iannelli, 5215 Pogue St., Spartanburg, S.C. 29301

Filed Sep. 2, 1982, Ser. No. 414,386
Int. Cl.³ B67D 5/54
U.S. Cl. 222—82 7 Claims



6. A housing for a pressurized syrup package used in a beverage dispensing machine comprising:
a main body portion constructed of material impervious to carbon dioxide, having a sealed bottom and open top;
said main body portion being of sufficient size for receiving a syrup package inserted therein through said top;

a cap provided for extending over said open top of said main body portion;

seal means carried between said cap and said main body portion providing a sealed chamber for said syrup package when said cap is inserted on said main body portion;

piercing pins carried by said cap for piercing said syrup package when said cap is positioned on said main body portion;

conduit means connected to said piercing pins through which carbon dioxide can be fed to said syrup package for pressurizing said package and for removing syrup from said package;

a cover extending over the top of said main body portion;

predetermined shaped openings provided in said cover corresponding to the cross sectional shape of said syrup package whereby said syrup package is rotated into proper orientation after being inserted into said housing for ensuring proper positioning of said piercing pins relative to said syrup package; and

said shaped opening of said cover having a curved abutment edge for receiving a package projection extending upwardly from said syrup projection, said abutment edge abutting said projection to properly position said syrup package in said housing.

4,501,384

DEVICE FOR MOUNTING CONTAINER BOX ON MOTORCYCLE

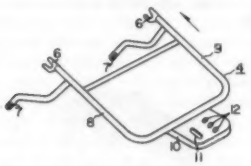
Masaki Itoh, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 25, 1983, Ser. No. 478,872

Claims priority, application Japan, Mar. 26, 1982, 57-43946[U]

Int. Cl.³ B62J 7/04

U.S. Cl. 224—32 A **5 Claims**



1. In a motorcycle having a container box mounted on the motorcycle above the rear wheel, a device for mounting said container box comprising:

supports mounted on said motorcycle;

means on said container box in sliding engagement with said supports and cooperating therewith to hold said box on said supports and to permit said box to slide in a back and forth direction along said supports; and

locking means for releasably fixing said container box selectively at one of at least two predetermined positions including a locking member fixed to said supports, said locking member having an elongated slot parallel to said direction of back and forth movement and a row of holes arranged parallel to said slot, a pair of locking bars engageable in said locking member, one of said bars being engageable in said slot and the other of said bars being engageable in said holes, key means connected to disengage and unlock both of said bars simultaneously from said locking member to permit said box to slide back and forth along and to be removed endwise from said supports.

4,501,385

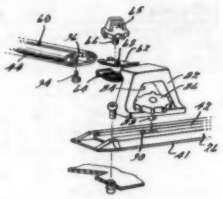
CROSS RAIL FOR VEHICLE LUGGAGE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 355,022, Mar. 5, 1982, abandoned, which is a continuation of Ser. No. 171,398, Jul. 23, 1980, abandoned. This application Apr. 11, 1983, Ser. No. 483,929

Int. Cl.³ B60R 9/04

U.S. Cl. 224—319 **5 Claims**



1. In a luggage carrier disposed on a horizontal surface of an automobile vehicle,

an elongated cross rail member elevated from said surface of said vehicle and a supporting end portion disposed at each end of said member clampingly adjustably engageable with said luggage carrier, said cross rail member having a cross section with a generally oval external surface configuration, having a leading edge, a trailing edge, a continuous bottom surface extending from said leading edge to said trailing edge and disposed on a continuous bottom wall portion, a pair of continuous upper surfaces disposed on a pair of continuous upper wall portions, a channel formed between said upper surfaces, including a first pair of interior surfaces parallel to at least a portion of said upper surfaces and a second pair of interior surfaces disposed on a pair of interior walls extending substantially perpendicularly downwardly one from each of said first pair of interior surfaces, each of said interior walls extending from substantially the interior of one of said upper wall portions into contact with the interior of said continuous bottom wall, forming an interior bottom surface of said channel along said bottom wall, each said supporting end portion having means adapted to be telescopically engageable with the other surfaces of said cross rail member and with said channel for engagement of said cross rail member and each said end portion together.

4,501,386

LUGGAGE RACK WITH PRE-ATTACHED END PIECE

William Rasor, Marysville, and Leon E. Redman, Bloomfield Hills, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed Sep. 29, 1983, Ser. No. 537,105

Int. Cl.³ B60R 9/00

U.S. Cl. 224—326 **11 Claims**

1. An article carrier for an automotive vehicle, said article carrier comprising:

an article supporting slat constructed to be mounted on a vehicle surface;

said slat includes a base and two side walls extending upwardly from said base and terminating above said base and being spaced apart to form a channel between said side walls and above said base;

said base having at a proximate one end thereof an opening;

an end cap member extending into said one end of said slat and having first and second receiving portions;

a first fastener passing through said opening of said base and engaging said first receiving portion to fasten said unitary end cap member to said slat; and

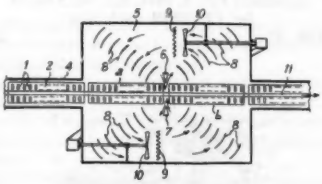
a second fastener positioned between said side walls and engaging said second receiving portion for securing said end cap member to said vehicle surface.

4,501,387

METHOD FOR BRAZING HEAT EXCHANGER CORES BY BLOWING HOT GASES

Francis L. E. Hoyer, Montlignon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Sep. 13, 1982, Ser. No. 417,089
Claims priority, application France, Sep. 17, 1981, 81 17585
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—183 **1 Claim**



1. A method for brazing heat exchanger cores, each comprising at least one tube and one heat dissipator with a hole for passing the at least one tube, the tube being brazed to the heat dissipator by a brazing alloy, comprising the steps of using part of the heat exchanger cores as a blading for guiding a hot pulsed gas provided to melt the brazing alloy; channeling the pulsed gas on an arcuate closed path in a cell provided for two heat exchanger cores while passing two heat exchanger cores longitudinally into the cell whereby one of the two heat exchanger cores is traversed in one direction by a first one of two flows of gas while another of the two heat exchanger cores is traversed by a second one of two flows of gas in another direction; and reversing direction of the gas with respect to the heat exchanger cores at least once during a period of time in which the heat exchanger core is subjected to a gas flux for carrying out the brazing.

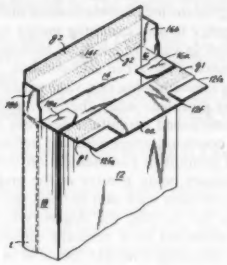
4,501,388

ANTI-SIFT CARTON

Benjamin J. Cassidy, Waldwick, N.J., assignor to International Paper Company, New York, N.Y.

Filed May 4, 1984, Ser. No. 606,953
Int. Cl.³ B65D *5/02*
U.S. Cl. 229—37 R **5 Claims**

1. An end structure for an anti-sift carton having opposed front and back panel and opposed side panels, in which the front and back panels have opposite major flaps each filling substantially the entire carton end opening; the side panels have opposite flaps divided into first and second minor parts, said first minor parts being first closed, one of said major flaps being next closed over said first minor parts, said second minor parts being next closed over said one major flap, and the other



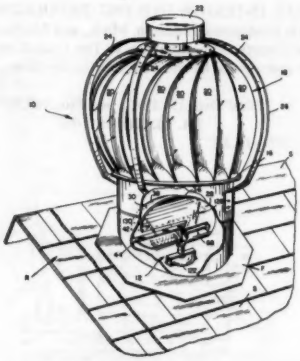
of said major flaps being finally closed over said second minor parts.

4,501,389

AUTOMATIC DAMPER ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Suroff, Jericho, N.Y., a part interest

Continuation of Ser. No. 313,345, Oct. 20, 1981, Pat. No. 4,416,415. This application Jun. 14, 1983, Ser. No. 504,179
Int. Cl.³ F24F *13/16*
U.S. Cl. 236—49 **2 Claims**



1. An automatic temperature and pressure responsive damper assembly for use within the conduit of a ventilating system designed to exhaust air from a defined space into the atmosphere comprising:

(a) mounting means for mounting said damper assembly within said conduit;

(b) at least one vane pivotally mounted on said mounting means, said vane being movable between an open position wherein said vane permits the passage of air through said conduit and a closed position wherein said vane precludes the passage of air through said conduit;

(c) means for opening said vane when the temperature of the air in said defined space reaches a predetermined level, said opening means including;

(i) camming means secured to said vane and being carried by said mounting means and having a camming surface thereon,

(ii) a temperature responsive drive assembly mounted to detect temperature changes of the air in said conduit, said drive assembly adapted to actuate in response to

the temperature change within a predetermined range, and

(iii) transmission means operably extending between said drive assembly and said camming surface of said camming means for communicating movement of said drive assembly to said camming means such that said vane is moved to varying positions in response to temperature changes of the air in said conduit;

(d) spring means biasing said vane to said closed position and opening said vane when there is a pressure differential of a predetermined magnitude between the end of said conduit in communication with said defined space and the end of said conduit in communication with said atmosphere, the pressure being greater at the end of said conduit in communication with said defined space; and

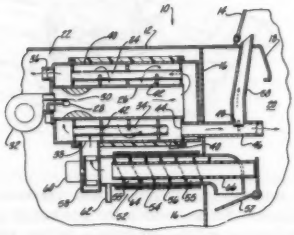
(e) means for varying the degree which said vane opens when subjected to a pressure differential, said varying means including a weight movable in relation to the pivotal axis of said vane, said weight being movably affixed upon a surface of said vane to partially counteract the force applied by said spring means.

4,501,390

VEHICLE INTERIOR DEICING/DEFOGGING SYSTEM

Charles J. Modzinski, Macomb, Mich., and Michael J. Devaney, Boone County, Mo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1982, Ser. No. 449,947
Int. Cl.³ B60H *1/02*
U.S. Cl. 237—12.3 C **3 Claims**



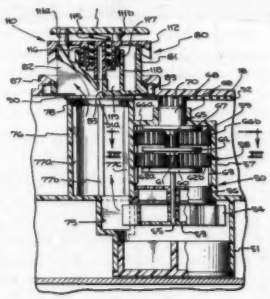
1. In an arctic vehicle that includes an engine compartment, a personnel compartment having terrain viewing windows, a fuel-fired heater equipped with an air inlet and air outlet, and duct means for conveying heated air from the heater outlet into the personnel compartment: the improvement comprising a heat exchanger located on the vehicle entirely outside the personnel compartment, said heat exchanger having external heat transfer surfaces exposed to the arctic atmosphere; said heat exchanger having internal air passage means of substantial length operatively connected between the personnel compartment and the heater air inlet; second duct means extending from the personnel compartment into communication with the heater air inlet, said second duct means constituting a bypass duct means around the heat exchanger passage means; selector valve means for alternately opening the second duct means and heat exchanger passage means; blower means for pumping air from the personnel compartment through the heat exchanger internal air passage means, or through the bypass duct means, and thence through the fuel-fired heater back to the personnel compartment; the heat exchanger having sufficient external heat transfer surface area exposed to the arctic atmosphere to condense water out of the air being pumped through the heat exchanger passage means; and condensate removal means at the downstream end of the heat exchanger passage means for preventing re-entainment of condensate into the air supplied to the heater; the size of the heat exchanger being such that heated air returned to the personnel compartment is sufficiently dry as to avoid significant fogging or icing on the interior surfaces of the windows.

4,501,391

HOSE END PATTERN SPRINKLER

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, Minneapolis, Minn.

Continuation of Ser. No. 345,946, Feb. 4, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,775
Int. Cl.³ B05B *1/02, 3/04*
U.S. Cl. 239—97 **24 Claims**



1. A pattern sprinkler having a housing, a water inlet to said housing, nozzle means for spraying water from said housing and a water passage within said housing communicating between said inlet and said nozzle means, said sprinkler further comprising:

an annular pattern plate means having a plurality of different configured spray pattern orifices provided threin in a circular array;

means for mounting said annular pattern plate means in the path of water flow through said water passage between said inlet and said nozzle means to control the pattern of water spray from said nozzle means in response to the particular spray pattern orifice positioned in the path of said water flow; and

water spray deflector means associated with said nozzle means for breaking up the nozzle water sprays emitted by said nozzle means, said deflector means including a plurality of deflection vanes biased toward a maximum spray deflecting position and water pressure operated means for urging said deflector vanes toward a minimum deflecting position in response to water pressure within said nozzle means.

4,501,392

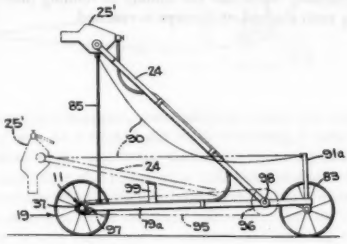
TORQUE DRIVEN IRRIGATION SYSTEM

James M. Hait, 8047 Chardonay Ct., San Jose, Calif. 95135

Division of Ser. No. 374,566, May 3, 1982,. This application Nov. 23, 1983, Ser. No. 554,659

Int. Cl.³ B05B *3/00*

U.S. Cl. 239—177.1 3 Claims



1. A self-propelled rotary irrigation system for connection at one end to a source of water located at the center of an area to be irrigated, said system comprising:

a length of pipe for carrying water, said pipe having a longitudinal axis;

a plurality of irrigation outlets arranged in spaced relationship along said length of pipe for discharging water therefrom;

means for mounting said pipe with said longitudinal axis of said pipe in a generally horizontal plane;

means for connecting a first end of said pipe to said water source in a manner such that the length of pipe is free to travel about said source and such that said first end is unable to rotate about said longitudinal axis of said pipe;

a first sprocket rotatably mounted adjacent to a second end of said pipe;

drive means powered by water from said pipe for alternately rotating said first sprocket in a first direction and in a second direction;

a second sprocket connected to said second end of said pipe;

a drive chain connected between said first and said second sprockets for alternately inducing and releasing a rotational torque about said longitudinal axis as said first sprocket rotates in alternate directions with the torque applied to a portion of said pipe adjacent a second end of said pipe, said rotational torque causing said pipe to rotate about said longitudinal axis with the amount of rotation of said pipe being proportional to the distance from said first end, the relative sizes of said first and said second sprockets causing said second end of said pipe to rotate through a much larger angle than the rotation of said first sprocket;

wheel means located at spaced intervals along the length of said pipe for supporting and advancing the pipe;

ratchet means connected between said wheel means and said pipe for allowing said pipe to rotate relative to said wheel means in a first direction and for securing said pipe to said wheel means as said pipe rotates in a second direction causing said wheel means to advance said pipe about said water source; and

means for limiting the rotational movement of said pipe to insure that said wheel means advances said pipe in substantially equal increments each time said pipe rotates in said second direction.

4,501,393

INTERNALLY VENTILATED NOISE SUPPRESSOR WITH LARGE PLUG NOZZLE

Garry W. Klees, Mercer Island, and Charles P. Wright, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/00327, § 371 Date Mar. 17, 1982, § 102(e) Date Mar. 17, 1982, PCT Pub. No. WO83/03281, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 17, 1982, Ser. No. 405,962

Int. Cl.³ B64D *33/04;* F01N *1/14;* F02K *1/08*

U.S. Cl. 239—265.13 25 Claims

1. In a jet engine nozzle adapted to exhaust a propulsive gas jet,

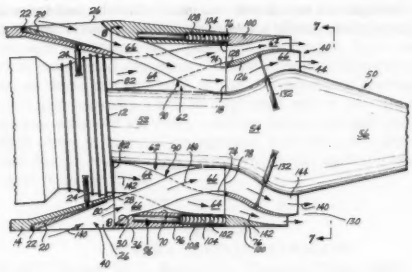
said nozzle having wall means longitudinally bounding a generally centrally positioned body, and an annular area extending between said wall means and said body,

an improved jet engine noise suppressor in said nozzle comprising:

separate first and second ducts having adjacent annular cross secions at entrance ends and exit ends, said ducts extending longitudinally through a portion of said annular area;

said first and second ducts being shaped and arranged to invert flow patterns through the respective ducts for discharging two separate flow patterns at the exit ends in a relationship inverted from that existing at the entrance ends;

said first ducts having entrance ends annularly around said body to receive gas exhaust from the engine and said second ducts having entrance ends radially outwardly of said first ducts and annularly along said wall means;



openings in said wall means to supply ambient air to the entrance ends of said second ducts;

doors operable to open and close said openings; and

means in said nozzle downstream of said portion to vary the flow path size and direction outwardly of said ducts according to the various flight mode requirements of the engine.

4,501,394

SPRAY GUN AIR CAP AND METHOD OF MAKING

Kui C. Kwok, Arden Hills, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed May 9, 1983, Ser. No. 492,840

Int. Cl.³ B05B *1/28*

U.S. Cl. 239—296 7 Claims

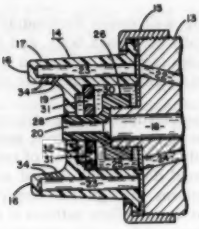
1. In an air spray gun of the type having air passages arranged in a nozzle around an axially positioned fluid passage

for atomizing the fluid emitted therefrom, the improvement in coaxially aligned fluid and air passages comprising

(a) an opening axially aligned in said nozzle;

(b) an insert in said nozzle in coaxial alignment with said opening and spaced from said opening, said insert having an axial opening therethrough;

(c) a spray tip having an orifice opening projecting through said axial nozzle opening, said spray tip being sized smaller than said axial nozzle opening, said spray tip also projecting through said insert axial opening in tight fitting relationship; and



(d) an axially concentric annular opening formed between said spray tip and said axial nozzle opening, said annular opening and said insert axial opening being precisely and exactly formed by a simultaneous drilling operation through said nozzle and said insert whereby said spray tip is precisely axially contained within said insert opening.

4,501,396

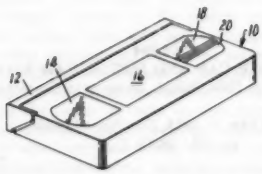
VIDEO CASSETTE TIME LEFT GAUGE

John P. Tomsyck, St. Paul, and Thomas J. Zohn, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1983, Ser. No. 500,544

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 **3 Claims**



1. A time-remaining gauge adapted to be affixed to a window covering a spool within a video cassette on which a magnetic recording tape may be wound, comprising

a sheet-like substrate having on one side thereof a layer of pressure sensitive adhesive for securing said gauge to said window and having indicia including a plurality of marks positioned to correspond to different radii on said spool and legends associated therewith identifying predetermined running speeds and the time remaining at a given speed at said diameters on said spool, whereby a user may affix the gauge to the cassette window and visually align the outer radius of the tape on the spool with said marks to accurately determine the amount of running time remaining until the end of the tape is reached.

4,501,397

METHOD OF STABILIZING FLIGHT OF A FLYING BODY AND FLIGHT-STABILIZED FLYING BODY

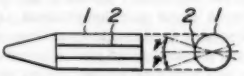
Hirotoshi Kubota; Akira Takano, both of Tokyo; Isao Arai, Soka, and Masayoshi Matsuzaka, Tokyo, all of Japan, assignors to University of Tokyo, Tokyo, Japan

Filed Oct. 12, 1982, Ser. No. 434,072

Claims priority, application Japan, Jan. 9, 1982, 57-1353

Int. Cl.³ B64C *17/00*

U.S. Cl. 244—75 R **7 Claims**

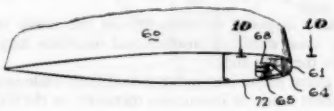


1. A method of stabilizing flight of a flying body having a circular cross-section, comprising a step of suppressing undesirable motion of the flying body for stable flight of the flying body by reducing an asymmetric side force occurring when said flying body flies at a high angle of attack with respect to an air current by means of at least two tripping wires provided on the outer periphery of said flying body, wherein a number of said tripping wires is at least two and an initial stagnation point of the air current lies on a midpoint between said tripping wires on said outer periphery of said flying body, an optimal azimuthal angle for tripping wire position resides in a region from 15° to 60° for non-dimensional tripping wire height normalized by the diameter of said flying body residing in a region from 0.007 to 0.014.

4,501,398
BEAM BALANCER ELECTRO-IMPULSE DEICING SYSTEMS

Paul E. Sandorff, Granada Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 214,541, Dec. 9, 1980, Pat. No. 4,399,967.
This application Dec. 10, 1982, Ser. No. 448,573
Int. Cl.[3] B64D *15/18*
U.S. Cl. 244—134 R 6 Claims

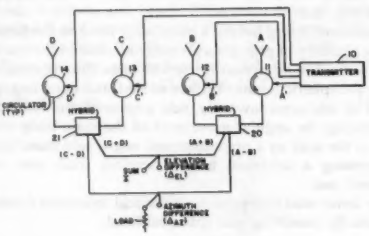


1. An electromagnetic pulse deicing system for deicing the surface skin of a blade, said blade including a nose portion formed by upper and lower surfaces terminating at a leading edge, said blade also including a mass balance element extending spanwise of said leading edge, comprising a nose-torquer mechanism secured to said mass balance element for imparting torsion to said mass balance element and twisting both said upper and lower surfaces to produce a torsional travelling deformation wave in said skin.

4,501,399
HYBRID MONOPULSE/SEQUENTIAL LOBING BEAMRIDER GUIDANCE

Jester M. Loomis, III, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 20, 1981, Ser. No. 284,895
Int. Cl.[3] F41G *7/24;* G01S *13/66*
U.S. Cl. 244—3.13 1 Claim

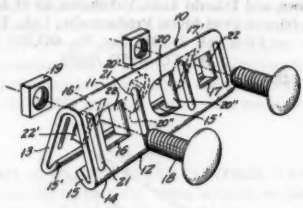


1. A beamrider guidance system for guiding a guided device toward a target; said system having multiple transmitting and receiving antenna means which are spatially offset from each other; the improvement comprising a method having the steps of transmitting a plurality of different coded radar signals sequentially by said antenna means towards said target and said guided device; selecting the number of coded radar signals to be equal to the number of antenna means such that each antenna means will always transmit the same coded radar signal; receiving and processing said signals by the guided device so as to provide guidance about a center position of all of the coded radar signals; utilizing reflected signals off said target from each of the coded radar signals to position said antenna means toward said target; utilizing a four-horn antenna feed for the multiple antenna means; and supplying the different coded radar signal to the horn feeds for transmission.

4,501,400
CABLE-CLAMP

Ignazio Leonardo, Mountainside, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.

Filed Dec. 10, 1981, Ser. No. 329,410
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[3] F16L *3/08*
U.S. Cl. 248—74.1 16 Claims

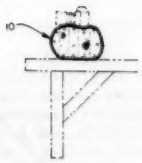


1. A cable-suspension fitting for clamped suspension of a given-diameter cable from a telephone pole or the like, comprising a unitary elongate stiff metal clamp having two elongate side panels integrally connected via a single longitudinal bend and divergent at an acute angle to their outer longitudinal edges, each side panel having at its outer longitudinal edge an inwardly bent flange of width less than side-panel width and oriented at an acute angle to its associated side panel, the inner limiting edges of said flanges being spaced from each other to an extent slightly less than said given diameter, whereby said clamp may be applied to the cable with snap action via the space between said flanges, said side panels having plural longitudinally spaced bolt apertures at corresponding locations between the longitudinal bend and the flanges, there being a clear unimpeded alignment of single geometric elongate cylindrical shape through both of the corresponding apertures of each pair, whereby a bolt through each pair of corresponding apertures may be set with a coacting nut to draw said panels to each other in clamped engagement with the cable and with said flanges establishing a permanent barrier against loss of the cable from the fitting.

4,501,401
CAMERA SUPPORT CUSHION

Paul T. Conee, 99 N. Beacon St., Hartford, Conn. 06105

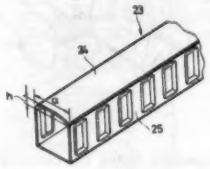
Filed Sep. 24, 1982, Ser. No. 422,858
Int. Cl.[3] A47G *29/00*
U.S. Cl. 248—346 12 Claims



1. A cushion for supporting a camera or the like, comprising: a substantially matched pair of panels joined to one another in spaced relationship by a peripheral wall extending thereabout, the configuration of said panels being that of a "super ellipse", the peripheral curvature of which is based upon the equation $X^n/A^n+Y^n/B^n=1$, wherein "n" has the value $2\frac{1}{2}$, "X" and "Y" represent Cartesian coordinates, and "A" and "B" are constants of appropriate value, and said panels and said peripheral wall cooperatively defining a space within said cushion; and a free-flowing filler material contained within said cushion

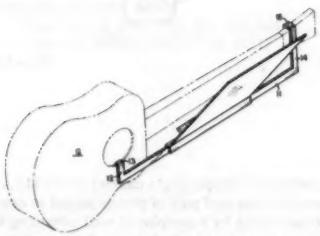
and substantially completely filling said space therewithin, said panels and said peripheral wall being made of a relatively supple material to permit deformation of said cushion and conformation to the camera.

4,501,402
METAL SKID FOR BUNDLING
Ken Saito, Tokyo; Tsuneo Ochi, Yokosuka; Kaoru Furunishi, Ichikawa, and Takeshi Yuki, Yokohama, all of Japan, assignors to Nippon Steel Metal Products Co., Ltd., Tokyo, Japan
Filed Feb. 3, 1983, Ser. No. 463,502
Int. Cl.³ B65D *19/28*
U.S. Cl. 248—346 **7 Claims**



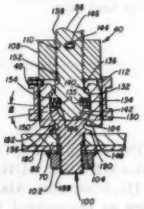
1. A metal skid for bundling adapted to be laid parallel to at least one other like skid to support a bundle of articles and to be fastened to the bundle by a strap or the like, characterized in that:
- said skid is of a substantially square-pipe-like shape having a hollow interior through which a bundling strap or the like may be passed;
- is made of light-weight sheet metal;
- has a top wall adapted to be contacted by a bundle placed thereon;
- has side walls depending from each side of said top wall; and
- has a bottom wall;
- said top wall being smoothly-curved upwardly-arched with a center of curvature below the upper ends of said side walls;
- said side walls each having a longitudinally arranged row of reinforcing embosses each extending a major portion of the height of said side walls and said row extending substantially the full length of said skid.

4,501,403
SHEET MUSIC TRAY FOR A GUITAR
Calvin O. Goodrich, P.O. Box 4879, Stockton, Calif. 95204
Filed Jun. 13, 1983, Ser. No. 460,276
Int. Cl.³ G10G *7/00*
U.S. Cl. 248—443 **4 Claims**



1. A sheet music retention device adapted to be removably attached to a guitar, wherein the guitar has a body provided with a sound hole therein, and wherein the guitar further has a neck provided with a forward portion, comprising in combination:
- a first hook arm adapted to removably engage the sound hole in the guitar body,
- a second hook arm adapted to removably engage the forward portion of the guitar neck,
- a bar member connected between and supporting said first and second hook arms,
- said bar member having an upper central portion thereof,
- an elongate channel adapted to be removably received on the upper central portion of the bar member,
- a music tray extending upwardly and outwardly from the channel, and
- a horizontally disposed retention lip on the music tray, whereby sheet music or instructional materials may be placed on the tray, and
- whereby a guitar player may move about freely while retaining the sheet music or instruction materials on the tray.

4,501,404
QUICK DISCONNECT ASSEMBLY
Alfred W. Nelson, Arlington, Tex., assignor to Textron Inc., Providence, R.I.
Filed Jul. 24, 1981, Ser. No. 286,634
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—503.1 **10 Claims**

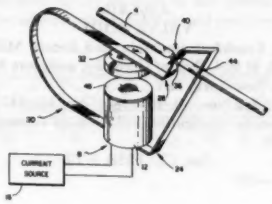


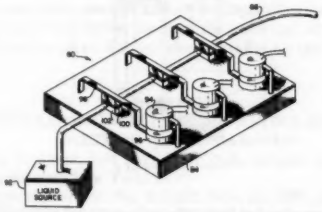
1. A quick disconnect assembly for releasably attaching a fixture to a support structure comprising:
- a tie down stud having a substantially spherical outer surface and means for attachment of said stud to the support structure, and
- an attachment fitting having a main body fixed to the fixture and a plurality of grip arms pivotally associated therewith, said arms having inwardly curved ends for cooperating with the spherical outer surface of said stud upon engagement of said arms inwardly, said grip arms and said stud permitting the angular movement of the main body relative to the stud by a predetermined angle, said main body comprising a spherical head extending from one end thereof, and
- said tie down stud comprising a spherical indention formed therein for receiving said spherical head.

4,501,405
FRICTIONLESS VALVE/PUMP
Joe D. Usry, Midvale, Utah, assignor to Bunnell Life Systems, Inc., Salt Lake City, Utah
Filed Jun. 21, 1983, Ser. No. 506,215
Int. Cl.³ F16L *55/14;* **F04B** *43/12*
U.S. Cl. 251—7 **5 Claims**

1. A valve comprising
- a flexible and resilient tube for carrying a fluid,
- an electrically energizable coil for producing an electromagnetic force when energized,
- a magnetically attractable element,
- resilient holding means for normally holding the element in a first position above the coil so that when the coil is energized the element and holding means are attracted toward the coil, and when the coil is de-energized the holding means moves the element away from the coil back

to the first position, wherein said holding means comprises an elongate leaf spring attached near one end to the coil and looped outwardly, upwardly and back toward the coil, with the magnetically attractable element attached to the leaf spring near the other end, and





anvil means disposed adjacent to the holding means with the two being positioned to extend between the holding means and the anvil means so that the tube is alternately pinched closed against the anvil and released to open by the holding means as the coil is alternately energized and de-energized.

4,501,406

SHUT-OFF DEVICE FOR A FLUID

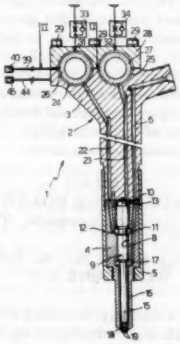
Helmut Walther, and Mario Palazzetti, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.a., Turin, Italy

Filed Jul. 14, 1983, Ser. No. 513,918

Claims priority, application Italy, Jul. 15, 1982, 67899 A/82

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—30 **18 Claims**



1. A fluid shut off device (1) including a body, (2) said body having a conduit (6) in which a fluid is adapted to flow, a cylindrical plunger (9) slideably received in a seat (8) formed in said body (2) said plunger having an end portion (15) adapted to close said conduit (6), and control means for controlling the movement of said plunger (9) in said seat (8) between first and second working positions in which said end portion (15) respectively closes and opens said conduit (6); said control means comprising: a chamber formed in said body; said plunger having a radial portion of reduced diameter; a conduit in said body; at least one hollow piezoelectric member having an internal and external surface (26) said member operably disposed inside said chamber (24) to communicate with said radial portion of said plunger (9) by means of said conduit, said fluid cooperating with said radial portion of said plunger (9) to displace said plunger axially within said body; said internal and external surfaces of said piezoelectric member (26) respectively having coatings (35) of electrically conducting material thereon and said coatings connected to corresponding power supply terminals (40,55) arranged outside said body (2).

4,501,407

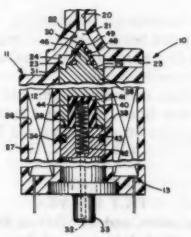
SOLENOID ACTUATED FLUID CONTROL VALVE

Myles N. Murray, Chagrin Falls, Ohio, assignor to Industrial Electronic Rubber Company, Twinsburg, Ohio

Filed Aug. 11, 1982, Ser. No. 407,074

Int. Cl. F16K *31/02*

U.S. Cl. 251—141 **21 Claims**



1. In a fluid control valve comprising a porting member including a port and a conical valve seat circumscribing said port, and port closing means including a valve element having an elongated rigid body and a resilient conical tip secured at one end of said rigid body, said valve seat and tip being correspondingly tapered and said porting member and valve element being relatively movable to open and close said port at said valve seat and tip, the improvement comprising a relatively small, annular sealing bead on, concentric with, and projecting from the correspondingly tapered surface of said tip for effecting sealing engagement between said tip and seat; in combination with stop means provided to limit the amount of compression of said annular bead and tip when engaged with said valve seat.

4,501,408

VOLUME CONTROL VALVE

Manfred Pawelzik, Soest, and Max Derr, Iserlohn, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,699

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127714

Int. Cl.³ F16K *3/08*

U.S. Cl. 251—314 **6 Claims**

1. A volume control valve for use in a sanitary fitting, having a first inlet orifice and a first outlet orifice said valve comprising:

a valve body adapted for insertion into said fitting, said valve body having a axial inlet orifice and radial outlet orifices;

a valve spindle rotatably mounted on said body;

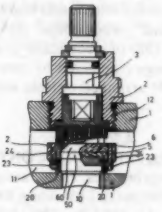
a valve seat insert disposed in said body and held in said body so as to be non-rotatable, said valve seat insert hav-

ing at least one through opening transverse to the longitudinal axis of said body;

a valve control disk rotatable on said valve seat insert by said spindle, said valve control disk having at least one through opening;

a circular seal supporting piece having at least one lug engaging said body and one lug engaging said valve seat insert to prevent said valve seat insert from turning;

a sealing element carried on said support piece, said sealing



element having a first portion on one side of said support piece and a second portion on the other side of said support piece;

said valve body including a shoulder;

said supporting piece being adapted to engage said shoulder such that said first portion prestresses said valve seat disk by a predetermined amount;

said second portion extending from said supporting piece toward said first inlet orifice and being deformable to sealing engage said fitting around said first inlet orifice.

4,501,409

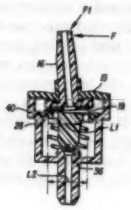
TILT VALVE

James J. Hill, Plantation, and Al Marven, Hollywood, both of Fla., assignors to Cook International, Inc., Palm Beach, Fla.

Filed Nov. 18, 1982, Ser. No. 442,674

Int. Cl.³ F16K *31/00;* **B65D** *83/00*

U.S. Cl. 251—354 **15 Claims**



1. A release valve for a pressurized vessel, said valve comprising:

a hollow valve body defining a chamber therein, said valve body mounted in an opening of said vessel and forming a sealing closure for said opening of said vessel;

inlet means for communicating said chamber with the interior of said vessel;

outlet means for communicating said chamber with a region exterior to said vessel;

means for pressure sealing said chamber;

first means in said valve body for selectively opening and closing said outlet means; and

means in said valve body for biasing said first means for opening and closing in a closing position, said means for biasing comprising a barrel-shaped spring extending between said valve body and said first means for opening and closing, said barrel shaped spring comprising a coil spring having a first end engaging said first means and a second end engaging a portion of said valve body, a diameter of a mid-portion of said spring is larger than a diameter of said first end and larger than a diameter of said second end.

4,501,410

VALVE BODY

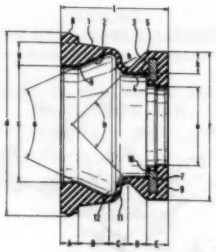
Rolf Weiler, Frankfurt am Main, and Reiner Müller, Hattersheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,547

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242188

Int. Cl.³ F15B *9/10*

U.S. Cl. 251—366 **6 Claims**



1. An integral valve body of elastic material adapted for use in the multiple function valve of a vacuum-operated brake power booster, the pedal-controlled operating rod of which makes a valve piston which ccntrols the pressure in the booster chamber slide and cooperates with the valve body, said valve body comprising two roughly circular cylindrical parts with different inner and outer diameters which are arranged one behind the other in the axial direction and are formed in one piece with a bellows portion that interconnects both parts, the invention in which a first of said parts of larger diameter is succeeded in the direction of the second part of smaller diameter by an annular portion whose radially internally and externally extending peripheral surfaces are constituted by the generated surfaces of circular truncated cones, with the internally extending generated surface forming an angle of opening of between 44° to 56°, and the externally extending generated surface being slightly conically tapered in the direction of the second part and the external peripheral surface of the portion succeeding the second part being the generated surface of a circular truncated cone which forms an angle of opening of between 80° to 100°, while the radially internal peripheral surface of this portion is the surface of a cylinder and in which the thin-walled bellows portion which interconnects both said portions has an S-shaped longitudinal sectional profile in the longitudinal direction of the valve body.

4,501,411

GUARDRAIL FOR ROADWAY

Yoshio Otaki, 35, Hayakitachooomachi, Yufutsu-gun, Hokkaido, Japan

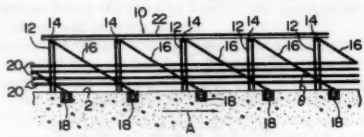
Filed Sep. 1, 1983, Ser. No. 528,586

Int. Cl.³ A01K *3/00*

U.S. Cl. 256—13.1 **9 Claims**

1. A guardrail for a roadway, including a row of plurality of posts disclosed outside and extending along one side edge of a roadway, said posts being arranged at a predetermined pitch, each of said posts having a lower end section rigidly secured to the ground, an intermediate section extending upwardly from said lower end section rigidly secured to the ground, an intermediate section extending upwardly from said lower end section and at least one arm extending from the upper end of said

intermediate section towards an adjacent lane of the roadway and termintating in an outer end positioned substantially above said side edge of said roadway, the vertical distance between said outer end of said arm and said side edge of said roadway being greater than the heights of vehicles moving on said roadway; anchors rigidly secured to the ground in said side edge of said roadway substantially at said predetermined pitch;



and a network formed by supporting cables each extending between the outer end of the arm of one of said posts and one of said anchors and lateral cables extending substantially parallel to the surface of said roadway and rigidly secured to said supporting cables, each of said supporting cables being inclined downwardly and forwardly from the outer end of the arm of one of sand posts in the direction of traffic on said roadway.

4,501,412

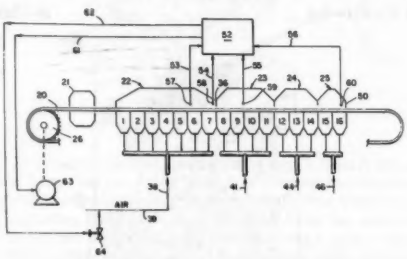
NON-POLLUTING HEAT RECUPERATIVE SINTERING METHOD AND APPARATUS

William T. Sweat, Salt Lake City, Utah, assignor to ASARCO Incorporated, New York, N.Y.

Continuation of Ser. No. 323,632, Nov. 23, 1981, abandoned, which is a division of Ser. No. 086,880, Oct. 22, 1979, Pat. No. 4,337,083. This application Jan. 13, 1984, Ser. No. 570,424

Int. Cl.³ C22B *1/08*

U.S. Cl. 266—178 **6 Claims**



1. In a sintering machine having a continuous horizontally disposed travelling grate, drive means for moving said grate, a sintering zone and at least first and second cooling zones, first windbox means for supplying a gas to the lower portion of said first cooling zone, second windbox means for supplying a gas to the lower portion of said second cooling zone, first hood means for removing gas from the upper portion of said first cooling zone, and second hood means for removing gas from the upper portion of said second cooling zone, the improvement comprising first recirculating means including a first conduit means communicating with said first hood means and said second windbox means for circulating the cooling gases from the first cooling zone directly to the second cooling zone, second recirculating means including second conduit means communicating with said second hood means and said first windbox means for circulating the cooling gases from the second cooling zone directly to the first cooling zone, said first recirculating means including gas cooling means disposed in said first conduit means and said hoods being partitioned from each other.

4,501,413

CLAMPING ELEMENT FOR STORAGE BATTERY PLATE STACKS

Joachim Illmann, Garbsen, and Heribert Füllgraf, Suthfeld, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

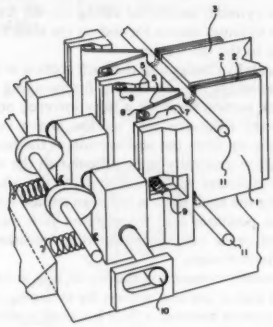
Division of Ser. No. 42,577, May 25, 1979, Pat. No. 4,342,449. This application Jan. 28, 1982, Ser. No. 343,500

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825126

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ B25B *1/20*

U.S. Cl. 269—43 **11 Claims**



1. A clamping system for holding a plurality of plate stacks of lead storage batteries constituting separating partitions within a cassette conforming to the plan dimension of the storage battery's block casing, wherein the clamping system includes a plurality of clamping elements each having two closely adjacent preformed leaf springs, and wedge-shaped elements which are slideable between the spring portions of adjacent clamping elements to provide means for alternative clamping of the two leaf springs so that said springs are moved toward each other, and unclamping of the two leaf springs so that said springs are moved apart from each other, so as to permit insertion into the block casing and closing of the assembly.

4,501,414

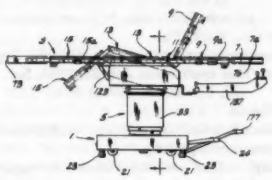
OPERATING TABLE

Edward M. Mason, St. Louis; Murray Q. Tanner, III, Florissant, both of Mo., and Michael J. Finley, Park City, Ill., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed Feb. 8, 1983, Ser. No. 464,873

Int. Cl.³ A61F *5/00*

U.S. Cl. 269—325 **9 Claims**



1. An operating table comprising:

a base;

a table top comprising, in order from one end thereof constituting its head end to its other end constituting its foot

end, a back section, a kidney elevator section, a seat section and a leg section;

means mounting the table top on the base for raising and lowering it relative to the base, sliding it endwise relative to the base, and tilting it endwise and laterally relative to the base, said mounting means comprising:

elevator means on the base,

a tilt frame mounted at the upper end of the elevator means for endwise and lateral tilting, and

a slide frame mounted on the tilt frame for endwise sliding movement relative to the tilt frame and for endwise and lateral tilting relative to the base with the tilt frame;

the seat section being secured to the slide frame;

hydraulic cylinder means for tilting the tilt frame endwise;

hydraulic cylinder means for tilting the tilt frame laterally;

hydraulic cylinder means for sliding the slide frame endwise relative to the tilt frame;

means pivotally connecting the back section at its foot end to the head end of the seat section for swinging movement of the back section between a fully lowered position angled downward from the seat section and a raised position extending up from the seat section at the head end of the seat section generally perpendicular to the seat section;

hydraulic cylinder means carried by the slide frame for swinging the back section between its said fully raised and lowered positions and maintaining it in either of these positions or in various intermediate positions of adjustment therebetween;

means pivotally connecting the leg section at its head end to the foot end of the seat section for swinging movement of the leg section between a fully lowered position extending down from the seat section at the foot end of the seat section generally perpendicular to the seat section and a fully raised position extending up from the seat section at the foot end of the seat section generally perpendicular to the seat section;

hydraulic cylinder means carried by the slide frame for swinging the leg section between its said fully raised and lowered positions and maintaining it in either of these positions or in various intermediate positions of adjustment therebetween; and

means mounting the kidney elevator section on the slide frame between the head end of the seat section and the foot end of the back section for sliding movement with the slide frame and for up and down movement relative to the slide frame between a fully lowered position generally flush with the seat section and a fully raised position elevated above the seat section, and comprising hydraulic cylinder means carried by the slide frame for moving the kidney elevator section up and down and between its said fully lowered and raised positions and for maintaining it in either of said positions or in various intermediate positions of adjustment therebetween.

4,501,415

BALANCED DEFLECTION GRIPPER FOR SHEET HANDLING EQUIPMENT

Michael H. Loebach, Fort Plain, N.Y., assignor to Motter Printing Press Co., York, Pa.

Continuation-in-part of Ser. No. 299,650, Sep. 4, 1981, abandoned. This application Jul. 28, 1983, Ser. No. 517,945

Int. Cl.[3] **B65H** *39/08;* **B41F** *1/28*

U.S. Cl. 270—60 **17 Claims**

1. A balanced deflection gripper mechanism for sheet handling equipment comprising:

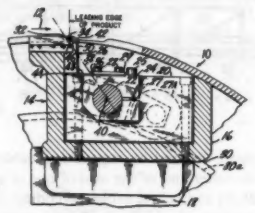
a clamping surface on which sheets of paper and the like may be positioned;

gripper means comprising a holder supported relative to said surface and a resilient gripper finger having one end fixed to said holder, wherein said gripper finger terminates in a tip;

means for rotating said holder about an axis for rotating said tip in an arc into engagement with said surface;

wherein said tip lies along a radius extending through said axis;

wherein upon engagement of said tip and surface further rotation causes said surface to impart a counterforce to said tip having a first component perpendicular to said radius and a second component along said radius and said further rotation causes displacement of said one end relative to said countersurface; and



wherein said gripper finger is formed such that said further rotation causes said gripper finger to deflect, imparting a force to said tip with a radial component which is substantially equal and opposite to said second component of counterforce, thereby producing non-sliding engagement between said gripper tip and said surface.

4,501,416

SHEET HANDLING APPARATUS

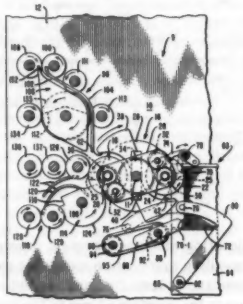
David A. Hain, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 19, 1982, Ser. No. 369,781

Claims priority, application United Kingdom, Nov. 10, 1981, 8133823

Int. Cl.[3] **B65H** *3/12*

U.S. Cl. 271—3.1 **14 Claims**



1. A sheet handling apparatus comprising:

holding means for holding a stack of sheets;

a release station;

a loading station;

pick-up means being moveable into engagement with a first sheet in said stack at one end of said holding means for the purpose of removing a said sheet from said stack; said pick-up means also being moveable into engagement with a sheet located at said loading station for the purpose of loading sheets one by one into said holding means at said one end;

mode selection means for selecting whether said sheet handling apparatus is to operate in a sheet pick-up mode or a sheet-loading mode; and

control means responsive to said mode selection means for controlling the operation of said pick-up means to pick up

a first said sheet in said stack and release it at said release station when said sheet handling apparatus is operated in said sheet pick-up mode, and also for controlling the operation of said pick-up means to pick up a sheet at said loading station and release it at said one end of said holding means when said sheet handling apparatus is operated in said sheet-loading mode;

said pick-up means being vacuum operated, and said control means being effective to control the application of vacuum to said pick-up means;

said pick up means including a rotatable assembly of vacuum operated pick-up members arranged to move in a planetary manner; each said pick-up member being arranged to rotate in a direction which is opposite to the direction of rotation of said assembly and being arranged to make rolling contact with a sheet when picking up a said sheet from said holding means.

4,501,417

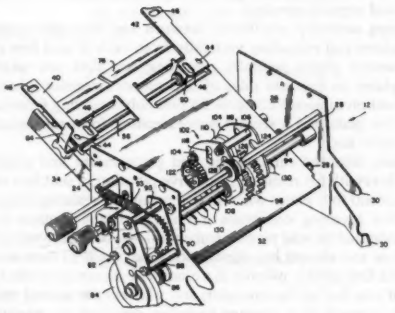
INSERTER FEEDER ASSEMBLIES

Dean H. Foster, Stratford, and Harold Silverman, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 185,857, Sep. 11, 1980, Pat. No. 4,373,711. This application Oct. 7, 1982, Ser. No. 433,200

Int. Cl.[3] **B65H** *3/52*

U.S. Cl. 271—124 **9 Claims**



1. In a feeder assembly comprising a tray, a front frame and a rear frame, the tray being positioned between the frames and adapted to carry a stack of sheet materials, feed wheel means for removing individual sheet material from the stack and advancing the individual sheet material along a path, a separator stone adapted to engage the undersurface of the individual sheet material to prevent multiple feeding, and bracket means for carrying the separator stone beneath the tray, the improvement providing for simplified feeder set-up comprising stone adjustment means for controlling the position of the stone and means for adjustably shielding the stone, the stone adjustment means including operator engageable means accessible adjacent the front frame, means pivotally mounting the bracket means about an axis extending transverse to the path, the adjustment means further including a stone adjustment shaft extending transversely of the path and beneath the tray for pivoting the bracket means about said axis extending transverse to the path, the stone adjustment shaft including cam means, the cam means being in engagement with the bracket means, and the cam means being rotatable for substantially vertically displacing the bracket means upon rotating the stone adjustment shaft to thereby pivot the stone carried by the bracket means when the operator engageable means is actuated, the shielding means including a stone shield slidably attached to the bracket means for adjustably shielding the stone, the stone shield being pivotable with the bracket means, and the shielding means including further operator engageable means adjacent the front panel for slidably moving the stone shield, whereby the bracket means and thus the separator stone and stone shield are substantially vertically displaced in response to operator actuation at the front of the feeder assembly.

4,501,418

STACKING DEVICE FOR PAPER SHEETS

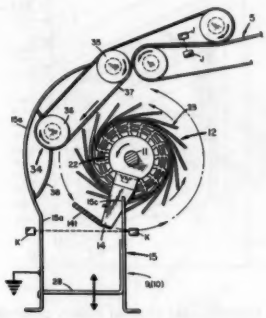
Yoshio Ariga; Toshiyuki Miyano, and Yukinori Wakisaka, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 20, 1982, Ser. No. 340,850

Claims priority, application Japan, Feb. 24, 1981, 56-24915[U]; Feb. 27, 1981, 56-28219

Int. Cl.[3] **B65H** *29/40, 31/32*

U.S. Cl. 271—187 **6 Claims**



1. A stacking device for evenly stacking paper notes successively along and discharged from a transport passage, each of said notes having a leading edge and a trailing edge, said stacking device comprising:

note transporting means for engaging the discharged notes at their leading edges and pulling the notes along a transporting path to a stacking box;

cradle means positioned along said transporting path and having a first operative position for temporarily receiving and stacking the notes from said transporting means and depositing said temporarily stacked notes in said stacking box;

note edge contacting means for contacting the trailing edge of each of said notes for securing said notes in engagement with said note transporting means as said notes are being pulled along the transporting path to said stacking box, said note contacting means further contacting the trailing edge of each of said notes as said notes are received and stacked on said cradle means to maintain an evenly stacked pile, said note edge contacting means being convex toward the transporting path; and

note removing means for removing each of said notes from said transporting means and depositing said notes into said stacking box when said cradle means is away from said first operative position.

4,501,419

COLLATOR HAVING A TRANSFER CAPABILITY

Yuji Takahashi, Tokyo; Hisaji Masaki, Kawasaki; Muneo Adachi, and Masaru Igarashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,573

Claims priority, application Japan, Aug. 28, 1980, 55-118614; Aug. 28, 1980, 55-118615; Aug. 28, 1980, 55-118616

Int. Cl.[3] **B65H** *31/24, 39/11*

U.S. Cl. 271—288 **20 Claims**

1. A collator comprising:

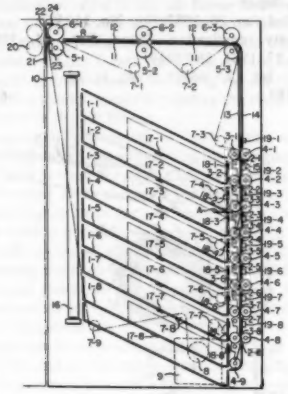
a plurality of record medium storage bins,

transport means for transporting record media to said storage bins,

deflection means for guiding said record media to said storage bins,

detection means for detecting an empty condition of said record media in said storage bins, and

control means for performing storage control for the record media with separation of said plurality of record medium storage bins into groups in accordance with a desired set



number, wherein said control means controls the operation of said deflection means such that when a predetermined amount of record media have been stored in a given storage bin in a group during the record medium storage operation, the recording media are transported to another storage bin in the same group, and when said detection means detects that the record media have been removed from the storage bin having the predetermined amount of record media stored therein, the transport of the record media to said emptied storage bin is permitted.

4,501,420

PLAYING SURFACES SPORTS

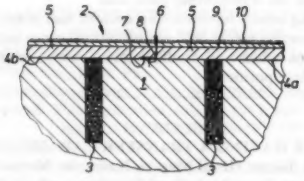
Peter L. K. Dury, West Bridgford, England, assignor to Nottingham County Council, England

Filed Apr. 25, 1983, Ser. No. 488,626

Claims priority, application United Kingdom, Apr. 27, 1982, 8212124

Int. Cl.³ A63C *19/00*

U.S. Cl. 272—3 **14 Claims**



1. A method of constructing a playing surface for sports and the like, characterised by the steps of:

(A) laying on a drained or water-permeable surface at least one envelope formed of a flexible water-permeable material and containing an unbonded base material comprising sand; and

(B) placing on to said envelope or envelopes a sheet of a resilient material.

4,501,421

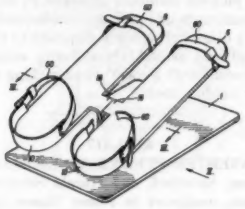
FOOT AND LEG EXERCISING DEVICE

James G. Kane, 6157 30th St., N.W., Washington, D.C. 20015; Ernest A. Pedicano, 99 Prospect St., Apt. 2C, Stamford, Conn. 06901, and James Pedicano, 120 Glenwood Rd., Ridgewood, N.J. 07450

Filed Aug. 18, 1982, Ser. No. 409,142

Int. Cl.³ A01B *23/04*

U.S. Cl. 272—96 **10 Claims**



1. A portable foot and/or leg exercising apparatus for an operator, comprising:

a base having a support member mounted thereon;

pivot means mounted on said support member;

a first and second foot plate positioned on opposite sides of said support member;

means centrally positioned between said first and second plates and extending vertically from each of said first and second plates pivotally mounting said first and second plates on opposite sides of said support member wherein said pivot means comprises a first hub extending from said first plate and a second hub extending from said second plate; and

means disposed surrounding said pivot means and coaxial therewith for resisting respective pivoting of said first and second foot plates wherein said means for resisting respective pivoting comprises a force resistant friction disk mounted on said pivot member and disposed between said first and second hub for frictional engagement therewith; the first plate is pivoted in a clockwise direction by the toe of one foot of the operator; and wherein the second plate is pivoted in a counterclockwise direction by pressure from the anterior aspect of the other foot of the operator so as to cause muscular action of the foot and/or leg of said operator.

4,501,422

APPARATUS FOR PLAYING A GAME OF SKILL

Edward A. Leshik, 122, Princess Ct., Queensway, London, England

Filed Dec. 2, 1982, Ser. No. 446,147

Claims priority, application United Kingdom, Dec. 2, 1981, 8136329

Int. Cl.³ A63B *71/06*

U.S. Cl. 273—1 GC **5 Claims**

1. An apparatus for playing a game and dispensing a liquid comprising:

liquid dispensing means;

two columns of a plurality of lights;

means for sequentially illuminating each of said lights of each column so that only one of said lights is illuminated at one time in response to a dispensing of a liquid, said means for sequentially illuminating including:

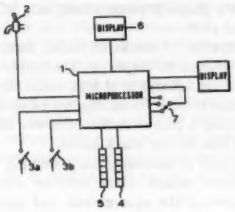
a microprocessor which alters the rate of sequential illumination of said lights;

means for setting the rate of sequential illumination whereby said game degree of difficulty is controlled; and

means for providing a visual indication of said degree of difficulty;

manually operable means for terminating said sequential

illuminations and maintaining illumination of a light illuminated at the time selected by a game participant, whereby said game is played by attempting to inhibit sequential illumination on a preselected light, and said



microprocessor records each time said sequential illumination stops on a selected light; and

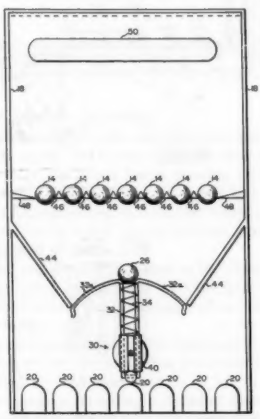
said microprocessor programmed to adjust said degree of difficulty of game in response to the ratio of game wins to game plays in a direction to stabilize said ratio.

4,501,423

POOL GAME APPARATUS

Louie J. Stewart, 1056 Conway St., Billings, Mont. 59105

Filed Aug. 11, 1983, Ser. No. 522,102
Int. Cl.³ A63F *7/00, 7/24, 7/34*
U.S. Cl. 273—122 R **4 Claims**



1. A game board apparatus, which comprises:

an elongated inclined top deck having a plurality of sides;

first and second balls;

means for holding said first ball on said elongated inclined top deck, said means for holding allowing physical movement of said first ball up said elongated inclined top deck and exposing said first ball to impact from said second ball when said second ball is driven up said elongated inclined top deck;

means for driving said second ball up said elongated inclined top deck toward said first ball;

elongated first and second guide means disposed on said elongated inclined top deck, said elongated first and second guide means converging downwardly toward said means for driving; and

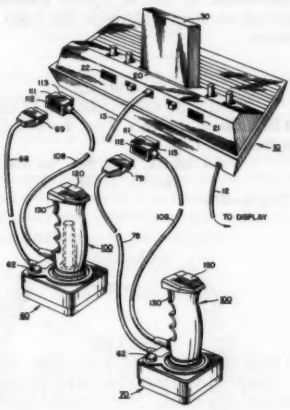
said means for driving comprising an assembly mounted for pivotal movement about an axis which is substantially perpendicular to said elongated inclined top deck, said assembly including means for holding said second ball utilizing only gravity, an elongated spring bias means and arms extending laterally of and independently of said means for holding said second ball to allow an operator to direct the direction of travel of said second ball and control the position of said arms, said arms being pivotable between a first position where they block an opening between the lower extremity of said first and second elongated guide means and a second position where they do not.

4,501,424

MANUAL CONTROLLER FOR VIDEO SYSTEM

George C. Stone, and Stuart E. Ross, both of Stamford, Conn., assignors to CBS Inc., New York, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,515
Int. Cl.³ A63F *9/22;* **H01H** *13/08, 21/10, 3/02*
U.S. Cl. 273—148 B **22 Claims**



1. For use in conjunction with a video game controller system which includes a pair of input ports, each being adapted for coupling to a manual controller unit which includes a base enclosure, a joystick member pivotally mounted at one end thereof in the base enclosure, means for producing indications representative of the pivot position of said joystick member, and means including a cable and connector for communicating joystick member pivot position indications to said controller system when said connector is coupled to an input port; an adapter for increasing the manual inputs that can be communicated from a manual controller unit to said video game controller system, comprising:

a shell open at one end and adapted to fit over and envelop said joystick member, such that said joystick member can be moved by manually moving said shell;

a switch mounted in said shell;

an auxiliary connector adapted for coupling to an input port of said video game controller system; and

conductive means for coupling the contacts of said switch to elements of said auxiliary connector;

whereby said manual controller unit with said adapter can be used to convey adapter switch information, as well as joystick member pivot position indications, from a player to the video game controller system.

17. For use in conjunction with a video game controller system which includes a pair of input ports each adapted for coupling to a manual controller unit which includes a base enclosure, a joystick member pivotally mounted at one end thereof in the base enclosure, means for producing indications representative of the pivot position of said joystick member, and means including a cable and connector for communicating joystick member pivot position indications to said controller system when said connector is coupled to an input port; a pair

of adapters for increasing the manual inputs that can be communicated from each of said manual controller units to said video game controller system, each adapter comprising:

a shell open at one end and adapted to fit over and envelop the joystick member of the respective manual controller unit such that said joystick member can be moved by manually moving said shell;

a switch mounted in said shell;

an auxiliary connector adapted for coupling to one of said input ports;

conductive means for coupling the contacts of said switch to elements of said auxiliary connector;

said auxiliary connector including an auxiliary input port for receiving the connector of the respective manual controller unit to couple elements thereof the respective input port;

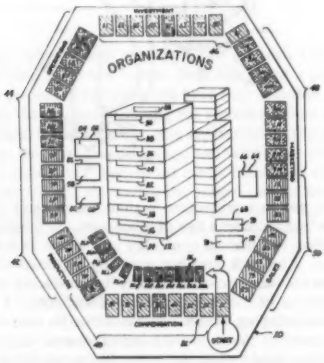
whereby each of said manual controller units, with its respective adapter can be used to convey adapter switch information, as well as joystick member pivot position indications, from a player to the video game controller system.

4,501,425

BUSINESS ORGANIZATION GAME

Daniel D. Alvarado, Phoenix, Ariz., assignor to Robert J. Alvarado, San Jose, Calif.

Filed Jul. 21, 1982, Ser. No. 400,460
Int. Cl.[3] H63F 3/00
U.S. Cl. 273—256 **7 Claims**



1. A game simulative of the vagaries of success within a corporation, said game comprising in combination:

(a) a game board having a first path and a second path;

(b) a plurality of playing pieces for each player, one of said playing pieces being used in conjunction with said first path and another of said playing pieces being used in conjunction with said second path;

(c) means for arbitrarily determining the number of squares each player in turn moves his playing piece along said second path;

(d) said first path including a number of levels having an ascending order of signficance relative to positions within the corporation;

(e) said second path being a continuous path segmented into a plurality of squares, said second path including a plurality of discrete sections, each said section embracing a number of squares and being representative of a work function within a corporation;

(f) a third path distinct from said second path with entry into said third path being determined by a designated one of the squares of said second path and having a terminal end remote from said second path, said third path having a plurality of further squares equal in number to the highest number available from said determining means, each further square being reflective of a quantity of said medium of exchange or said certificates of stock to be delivered to a player;

(g) each square of each said section including a certain directive pertinent to movement of the respective one of a player's playing piece along one of said first and said second path;

(h) a plurality of stacks of cards, each said stack of cards being related to employee evaluation criteria;

(i) one of the squares in at least some of said sections including a directive referencing one of said stacks of cards and subjecting a player to the directive of a card in the referenced one of said stack cards;

(j) a medium of exchange for reflecting each player's financial status which status may be altered in response to directives of the squares and said cards; and

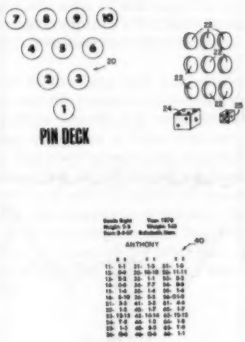
(k) a plurality of certificates of stock for determining each player's degree of ownership in the corporation which degree of ownership may be altered in response to directives of the squares and said cards.

4,501,426

BOWLING GAME

John R. Seltz, P.O. Box 1447, Lancaster, Pa. 17604

Continuation of Ser. No. 163,016, Jun. 25, 1980, abandoned.
This application Jun. 7, 1982, Ser. No. 385,977
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—277 **14 Claims**



1. A bowling game for realistically simulating the scoring obtained in each frame of a conventional bowling game, the scoring results being separately obtained for the first ball of a frame and for the second ball of the frame when the first ball does not result in a strike, including:

bowler card means having a series of identifier indicia and corresponding strike indicators and spare indicators;

chance means for providing identifier number corresponding to said identifier number indicia on said bowler card means, said chance means identifying, by means of said identifier numbers and corresponding identifier number indicia, a corresponding strike indicator for a first ball in a frame and a corresponding spare indicator for a second ball in a frame, and providing row selector totals for specifying scoring results;

a plurality of first ball result boards incorporating strike and spare leave indicia representing the number of pins scored on the first ball of a frame, at least one of said first ball result boards having columns of indicia corresponding to the particular frame being bowled and adapted to produce

different results for different frames, and having rows corresponding to the strike indicators on said bowler card, at least another of said first ball result boards having columns of indicia corresponding to selected results obtained from said at least one first ball result board and having rows of indicia corresponding to row selector totals provided by said chance means; and

a plurality of second ball result boards incorporating spare scoring indicia representing the number of pins scored on the second ball of a frame, the indicia of said second ball result boards being arranged in columns corresponding to said spare leave indicia from said first ball result boards and in rows corresponding to said spare indicators from said bowler card, said second ball result indicia representing the number of pins scored on the second ball of a frame.

4,501,427

TARGET APPARATUS

Vay B. Payne, 1 Boundary St., Beaudesert, Queensland, 4285, Australia

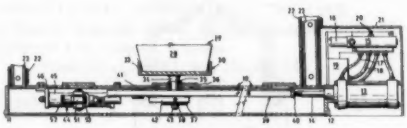
PCT No. PCT/AU83/00079, § 371 Date Feb. 7, 1984, § 102(e) Date Feb. 7, 1984, PCT Pub. No. WO83/04433, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 9, 1983, Ser. No. 582,571

Claims priority, application Australia, Jun. 9, 1982, PF4370

Int. Cl.³ F41J *7/00, 1/02*

U.S. Cl. 273—406 **7 Claims**



1. A target apparatus including:

a framework having upright side members and substantially horizontal upper and lower frame members between the side members, the lower frame member being hollow;

means rotatably mounted on the upper and lower frame members for supporting at least one target therebetween;

a gear wheel in the lower frame member connected to the target support means;

an operating rod slidably mounted in the lower frame member in operating engagement with the gear wheel;

means to reciprocate the operating rod to rotate the target support means; and

damping means connected to the operating rod to damp the movement of the operating rod, the lower frame member being filled with oil, and

the damping means including a cylinder in communication with the interior of the lower frame member so that the oil acts as a damping medium.

4,501,428

ROLL SEAL BOXES FOR CONTINUOUS VACUUM TREATING APPARATUS

Susumu Ueno; Kouiti Kuroda, both of Ibaraki; Hajime Kitamura, Ichihara; Masaie Tohkai, Ibaraki; Ken-ichi Kato, Tokyo, and Nobuyuki Hiraishi, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,373

Claims priority, application Japan, Jun. 17, 1983, 58-107871; Jun. 17, 1983, 58-107874

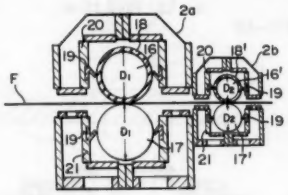
Int. Cl.³ F16J *15/40, 15/46*

U.S. Cl. 277—12 **5 Claims**

1. A continuous vacuum treating apparatus comprising:

a vacuum treating chamber for continuously treating a workpiece of soft material in a vacuum; and

a plurality of auxiliary vacuum chambers located anterior and posterior to said vacuum treating chamber, each of said auxiliary vacuum chambers comprising an upper seal roll and a lower seal roll forming a pair maintained in contact with each other and arranged to extend perpendicular to a direction in which said workpiece of soft material is conveyed, a plurality of pairs of ripple members having the ripple members of each pair being located in spaced juxtaposed relation and extending axially of one



of the seal rolls along its outer periphery, and a pair of side pieces each positioned against one of opposite end faces of the pair of upper and lower seal rolls; wherein the improvement resides in that:

the diameter of each of the upper and lower seal rolls of the auxiliary vacuum chambers disposed on the vacuum treating chamber side is made smaller than that of each of the upper and lower seal members of the auxiliary vacuum chamber located closest to the atmosphere.

4,501,429

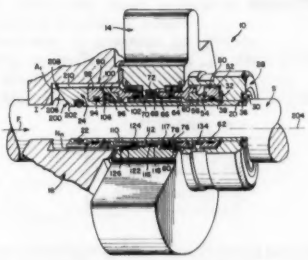
MECHANICAL SEAL FLUSH AGITATOR AND WEAR MONITOR FOR MECHANICAL SEALS

Richard E. White, Newark, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,387

Int. Cl.³ F16J *15/16, 15/34;* **G02B** *5/17*

U.S. Cl. 277—24 **10 Claims**



1. A contaminant flush agitator for a mechanical shaft seal comprising:

a sleeve having a body with a shaft receiving bore therethrough and a radial extension on one end thereof; and contaminant impeller means formed on said radial extension for moving contaminants in a fluid surrounding said seal away from said impeller means, said contaminant impeller means being formed on and end surface of said radial extension and including at least one projection extending from a base on said end surface axially of said body to an apex spaced from said base, said projection having a contaminant engaging surface sloping radially outwardly from said base toward said apex.

4,501,430

MEANS OF SEALING OFF THE INSIDE OF A PULVERIZER

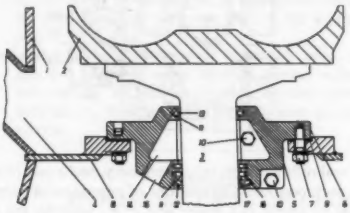
Wilhelm Kuhl, Essen; Dieter Kiefer, Wesel-Bislich, and Max Josefowitz, Oberhausen, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,486

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244362

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—59 **6 Claims**



1. An arrangement for sealing off the inside of a pulverizer from the outside atmosphere, particularly a bowl-mill pulverizer comprising: a horizontal rotating bowl-type grinding ring rigidly connected to a shaft; a barrier chamber and ring seals in a ring-seal holder and bordering said barrier-air chamber, said ring seals comprising slide rings that demarcate the barrier-air chamber, a ring seal on a side of the chamber facing the inside of the pulverizer being arranged in a wider clearance with respect to the rotating part of the pulverizer than those ring seals on the other side.

4,501,431

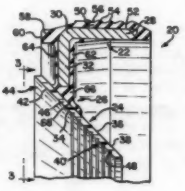
COMPOSITE TEFLON HELIX SEAL

Glenn Peisker, Barrington; Keith Christiansen, Fox River Grove, and Gil Jaime, West Dundee, all of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Dec. 19, 1983, Ser. No. 563,149

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—134 **16 Claims**



1. A fluid seal assembly for retaining fluid within and excluding foreign materials from, a sealed region defined by said seal and first and second, relatively movable machine elements, said seal assembly comprising, in combination, a casing element of generally annular form, having a mounting portion adapted to be received in fixed relation with said first machine element and a bonding portion adapted to receive an elastomeric element bonded thereto in fluid tight relation, said seal assembly also including a resinous fluorocarbon primary seal ring unit, said seal ring unit being, in its unstressed condition, of tapering-annular form and thin cross-section and being defined by reduced and enlarged diameter end surfaces and by closely spaced apart, generally parallel, radially inner and outer seal ring surfaces, with one of said inner and outer surfaces being an active surface having a primary seal band portion formed thereon adjacent one of such end portions, said seal band being adapted to engage a part of said second machine element in substantially fluid tight dynamic relation and the other of said inner and outer surfaces being a reverse surface having one portion thereof disposed in use in generally facing relation to said sealed region, said reverse surface further including a circumferential band portion acting as a bonding surface, and an elastomeric flexible positioning collar unit having one portion bonded to said casing and another bonding portion bonded to said bonding band on said primary ring, and a principal body portion extending between said bonded portions so as to positively but resiliently locate said primary seal ring within said casing.

4,501,432

CYLINDER-HEAD COVER GASKET

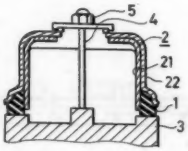
Toru Kuniyoshi, Ichinomiya, and Ryoji Okumoto, Nakashima, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 15, 1984, Ser. No. 590,052

Claims priority, application Japan, Mar. 17, 1983, 58-39424[U]

Int. Cl.³ F16J *15/06*

U.S. Cl. 277—168 **2 Claims**



1. In a cylinder head cover provided with a peripheral gasket-receiving groove, generally square-shaped in section except for the bottom thereof, defined by two plates, one of which is straight, in section, in its groove-defining part and the other of which converges toward the one to form a wedge-shaped space adjacent the one plate at the bottom of the groove, the combination of a resilient gasket having a portion generally conforming to the square-shaped portion of the groove and having a portion somewhat triangular in section projecting into said space, whereby on compression of said gasket against a cylinder head the entire groove is filled by said gasket so that strong compression thereof is maintained and the seal between said gasket and the cylinder head is strong and effective.

4,501,433

APPARATUS FOR PRACTICING GOLF STROKE

Monroe Pulley, Jr., 5131 N. 17th Ave., No. 2, Phoenix, Ariz. 85015

Filed May 20, 1983, Ser. No. 496,608

Int. Cl.³ A63B *69/36*

U.S. Cl. 280—47.26 **5 Claims**

1. A golf cart comprising

(a) a frame adapted to receive and transport a golf bag;

(b) a plurality of ground engaging wheels rotatably mounted on said frame;

(c) means for practicing a golf stroke, said means including

(i) a base member attached to one of said ground engaging wheels; and

(ii) means for suspending a golf ball from said base member at a predetermined distance laterally thereof so that

a suspended golf ball may be struck by the head of a golf club during a practice stroke by a golfer.

4,501,434

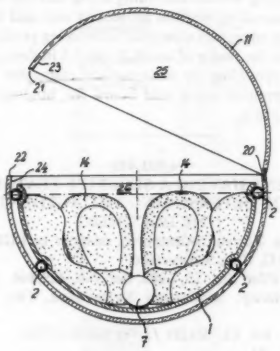
VEHICLE FOR A FUN-FAIR OR THE LIKE

Jean L. Dupuis, Braine-L'Alleud, Belgium, assignor to D. M. International Ltd., London, England

Filed Sep. 17, 1982, Ser. No. 419,140

Int. Cl.³ A63G *23/00, 29/00*

U.S. Cl. 280—206 **3 Claims**



1. A vehicle comprising a sphere adapted to freely rotate upon its outer surface having separate upper and lower segments pivotally connected at a point on the periphery of the sphere thereby permitting opening and closing of the sphere; a car comprising a spherical segment provided with at least one means on its outer surface adapted to rotatingly bear against the inner surface of said sphere thereby separating said car from said inner surface while permitting free rotational movement of said car apart from the rotational movement of said sphere; at least one seat within said car adapted to receive and secure a passenger therein; and means associated with at least one of said bearing means for braking the rotational movement of said car with respect to said sphere thereby permitting said passenger to control the rotation of said car with respect to the rotation of said sphere, said braking means comprising a braking surface adapted to contact the inner surface of said bearing means thereby securing said bearing means against rotation.

4,501,435

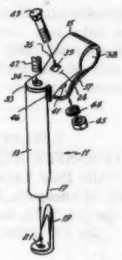
WELDED STEM ASSEMBLY

David K. McMurtrey, Rte. 2, Box 154G, Maysville, Ky. 41506

Filed Sep. 27, 1982, Ser. No. 424,004

Int. Cl.³ B62K *21/18*

U.S. Cl. 280—279 **16 Claims**



1. A stem assembly for securing the handlebars of a bicycle to the frame comprising:

a tubular barrel having a longitudinal axis, a top end, and a side portion; and

a sheet metal head section having a lip section and a pair of spaced side sections extending downwardly from and generally perpendicular to said lip section, said head section being adapted to engage said tubular barrel such that said lip section extends over said top end of said tubular barrel and said side sections of said head section abut said side portion of said tubular barrel, each of said side sections having a longitudinal edge extending generally parallel to said longitudinal axis of said barrel, said longitudinal edges of said sections being spaced from each other, said head section and tubular barrel being connected by welds between each of said longitudinal edges of said side sections of said head section and said side portion of said tubular barrel.

4,501,436

SUPPORTING ASSEMBLY FOR A SUSPENSION

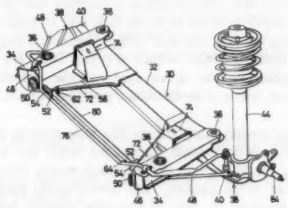
Takashi Ishida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 28, 1983, Ser. No. 479,516

Claims priority, application Japan, Mar. 31, 1982, 57-51188

Int. Cl.³ B62D *21/02;* B60G *7/02*

U.S. Cl. 280—666 **7 Claims**



1. A suspension supporting assembly for a vehicle body, comprising:

a transverse member extending in a transverse direction of said vehicle body;

a pair of tension rod brackets extending in a longitudinal direction of said vehicle body and affixed at one end thereof to opposite ends of said transverse member;

said supporting assembly being elastically mounted under said vehicle body only through insulators mounted in said

pair of tension rod brackets so as to reduce vibrations which are transmitted from said assembly to said vehicle body;

a pair of tension rods affixed at one end thereof to other ends of said tension rod brackets;

a pair of transverse links attached outward of said transverse member;

said tension rods being attached at the other end thereof to said transverse links; and

a reinforcing member provided with end portions thereof connected to said pair of tension rod brackets and spaced from and disposed parallel to said transverse member.

4,501,437

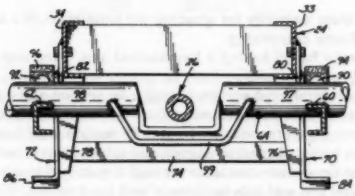
LOAD TRANSFER AXLE ASSEMBLY

David A. Becker, White Bear Lake, Minn., assignor to Dorso Trailer Sales, Inc., Minneapolis, Minn.

Filed Apr. 21, 1983, Ser. No. 487,293

Int. Cl.³ B60G *9/02*

U.S. Cl. 280—704 **13 Claims**



1. In combination with a vehicle of the type wherein forward steerable and rearward drive wheels support the vehicle, the vehicle having a main frame including a pair of spaced longitudinal side rails and a drive shaft extends longitudinally beneath the vehicle between the side rails from a forwardly placed engine to the rearward drive wheels, the improvement being a variable load transfer assembly mounted forwardly of the drive wheels which comprises:

a pivot mounting bracket secured laterally across the vehicle main frame beneath the drive shaft;

an auxiliary frame having a first end and a second end, the auxiliary frame being pivotally mounted at its first end to the mounting bracket to permit the auxiliary frame to pivot on a lateral axis relative to the vehicle main frame between a raised position and a lowered load support position, a portion of the auxiliary frame being constituted as a laterally extending unitary axle member adjacent the second end of the auxiliary frame and the axle member having a first side portion, a second side portion and a drop center portion with the first and second side portions defining an axle axis and being connected together by the drop center portion which is offset from the axle axis to accommodate the drive shaft of the vehicle when the auxiliary frame is in the raised position relative to the main frame;

alignment maintaining means for maintaining the auxiliary frame in longitudinal alignment with the vehicle main frame, the alignment maintaining means including a plurality of pivot guides, each pivot guide having a guide plate secured to one of the side rails to extend downwardly therefrom and a guide block extending rearwardly from the auxiliary frame in close slidable longitudinal alignment with its respective guide plate, and each guide plate having a raised shim plate adjacent its upper end to provide a snug surface for its respective guide block when the auxiliary frame is in the raised position;

a pair of wheels rotatably mounted coaxially along the axle axis of the axle member for engaging a ground surface when the auxiliary frame is in the lowered load support position with a lowermost portion of each wheel being at least about eleven inches above the ground when the auxiliary frame is in the raised position and the ground is substantially planar; and

variable force application means for controlling the pivoting of the auxiliary frame between the raised position and the lowered load support position.

4,501,438

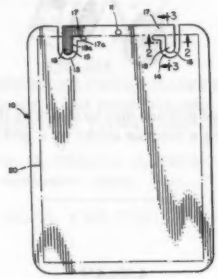
CLIPBOARD

Robert G. McKee, 30 W. Chicago Ave., Chicago, Ill. 60610

Filed Jul. 16, 1981, Ser. No. 283,982

Int. Cl.³ B32B *3/06*

U.S. Cl. 281—45 **7 Claims**



1. A clipboard comprising a flat and generally rectangular board of substantially rigid but flexible, spring-like material; said board having cutouts along one edge thereof defining a pair of integral L-shaped spring members normally flush with the remainder of said board; each of said L-shaped members having a first leg portion extending along said one edge and an elongated second leg portion projecting into said board away from said one edge; said elongated second leg portion having a length within the range of about 1.5 to 2.5 inches; said second leg portion providing an undersurface engagable with sheet materials supported upon said board for holding said sheet materials in place.

4,501,439

DOCUMENT HAVING A SECURITY FEATURE AND METHOD OF DETERMINING THE AUTHENTICITY OF THE DOCUMENT

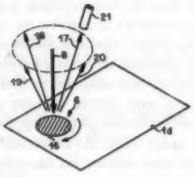
Gregor Antes, Zurich, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Sep. 28, 1982, Ser. No. 425,466

Claims priority, application Switzerland, Oct. 27, 1981, 6835/81

Int. Cl.³ B42D *15/00*; G02B *27/38*

U.S. Cl. 283—91 **6 Claims**



1. A security blank including a substrate having two major surfaces,

comprising, in combination,

a transparent thermoplastic layer having a predetermined refraction index as defined by light incident thereon, and

being suitable for embossing thereon a machine-readable authenticity feature in the form of an optical microstructure,

and

a transparent protective layer having a prearranged refraction index for covering and protecting said microstructure,

said prearranged refraction index of said transparent protective layer having a value different from said predetermined refraction index of said transparent thermoplastic layer, and

wherein said microstructure includes means for generating a characteristic diffraction effect from the light incident thereonto, said characteristic diffraction effect being normally detectable by the unaided eye of an observer,

a surface of the substrate facing said transparent thermoplastic layer including within a region of said microstructure means for producing diffuse reflection characteristics of a predetermined magnitude,

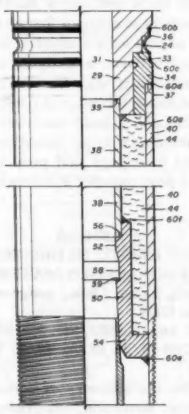
the difference between said refraction indexes of said transparent layers being sufficiently small, and the magnitude of said diffuse reflection characteristics of the surface of the substrate facing said transparent thermoplastic layer being sufficiently large so that said characteristic diffraction effect of said microstructure is substantially not detectable by the unaided eye of an observer.

4,501,440

INSULATED TUBING JOINT

David M. Anderson, Whittier, and Yung J. Kim, Hacienda Heights, both of Calif., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jan. 17, 1983, Ser. No. 458,417
Int. Cl.³ F16L *59/14, 9/22*
U.S. Cl. 285—47 **10 Claims**



1. A concentric wall insulating tubular joint incorporable in a tubular conduit string for use in transporting a heated fluid in a subterranean well, comprising:

a first tubular member;

a second concentric tubular member, the second tubular member being prestressed in tension and the first tubular member being prestressed in compression;

first and second interior coupling members between, on opposite ends of and affixed to the first and second tubular members;

an annular insulating cavity defined between the spaced apart first and second tubular members and extending between the first and second coupling members; and

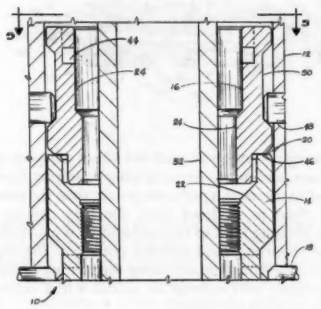
at least one membrane seal extending between one of the tubular members and one of the interior coupling members, the annular insulating cavity being sealed at the juncture of each tubular member and each interior coupling member.

4,501,441

TENSION HANGER LANDING BOWL

Mark E. Crews, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Mar. 31, 1982, Ser. No. 363,850
Int. Cl.³ F16L *21/00*
U.S. Cl. 285—143 **4 Claims**



1. A wellhead assembly comprising:

a wellhead member;

means providing an upper outer shoulder and an inner lower shoulder within said wellhead member;

a landing bowl assembly supported by said upper outer shoulder and having at least two segments, means connecting the segments and means biasing the segments outward;

said landing bowl assembly having an inner landing shoulder adapted to receive and support a tubing string landing shoulder when said segments are moved inward;

a plurality of pins threaded through said wellhead member above said shoulders;

means on said pins providing a removable first stop position and a second stop position, said pins when in said first stop position engaging the exterior of said segments and when in said second stop position moving said segments inward; and

said pins when moved to said second stop position moving said segments radially inward past said upper outer shoulder to their tubing string supporting position above said inner lower shoulder whereby said segments are loaded by the tubing string and moved onto said inner lower shoulder to support said tubing string within said wellhead member.

4,501,442

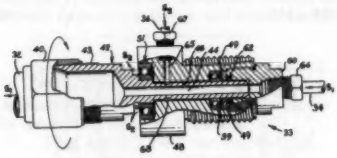
APPARATUS FOR SUPPLYING FLUID TO A ROTATING TUBE

Fred P. Partus, Marietta, Ga., assignor to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 268,611, Jun. 1, 1981, Pat. No. 4,389,231.
This application Feb. 22, 1983, Ser. No. 468,812
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—190 **3 Claims**

1. Apparatus for supplying through a rotating joint fluid to a rotary element substantially uncontaminated with ambient air, and with the apparatus comprising a support member having an open ended bore; a rotary element having a portion thereof rotatably positioned; in the bore an outer bearing mounted to said support means about said bore adjacent to said open end and mounter to said rotary element; first conduit

means extending into said support means and communicating with said bore through which supplying fluid may be fed to the rotary element journaled within the bore and the outer bearing; seam means between said bore and said rotary element adjacent said first conduit means; second conduit means communicating with the bore of said support means through which a purging fluid may be fed into and at least partially through the bore and through said outer bearing to ambient atmosphere and also into the portion of the bore of the support means



communicating directly with said seal means adjacent said first conduit means, and means for supplying a purging fluid to the second conduit means at a pressure greater than the pressure of the supply fluid as it flows from the first conduit means through the rotating joint so that ambient air is prevented from entering the supplying fluid and any portion of the supplying fluid is prevented from contaminating the bearing in the rotary joint and escaping into ambient air should a leak occur in the seal means of the rotary joint.

4,501,443

FLUIDTIGHT PIPE JOINT

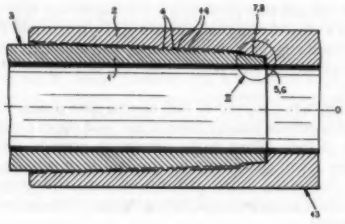
Manfred Häring, Düsseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,384

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207182

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—328 **8 Claims**



1. In combination, a first and a second metallic tubular member adapted to be coaxially interfitted in a fluidtight manner,

said first member having a plug-shaped extremity with an outer peripheral surface converging generally frustoconically toward a transverse annular end face thereof, said outer surface being provided with male helicoidal threads separated from said end face by a first unthreaded zone, said end face being formed with a first spiral track,

said second member having a socket-shaped extremity with an inner peripheral surface diverging generally frustoconically from a transverse inner annular shoulder toward an entrance end thereof, said inner surface being provided with female helicoidal threads separated from said shoulder by a second unthreaded zone and matingly engageable by said male helicoidal threads upon insertion of said plug-shaped extremity into said entrance end, said annular shoulder having an inner diameter substantially equaling that of said end face and being provided with a second spiral track generally complementary to said first spiral track for mating engagement therewith upon said end face approaching said shoulder,

said first and second spiral tracks being of a pitch tending to expand said first unthreaded zone radially into close contact with said second unthreaded zone upon relative rotation of said extremities into a terminal relative position of interengagement.

4,501,444

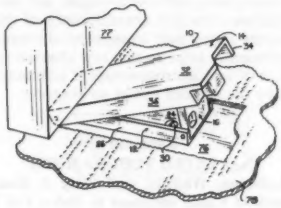
COLLAPSIBLE DOOR WEDGE WITH QUICK RELEASE MECHANISM

Edward J. Domínguez, 503 Park Ave., San Jose, Calif. 95110

Filed Mar. 8, 1982, Ser. No. 355,969

Int. Cl.³ E05C *17/54*

U.S. Cl. 292—342 **11 Claims**



1. A collapsible door wedge with quick release mechanism comprising: an elongated base member; an elongated incline member having a lower surface provided with a pair of downwardly extending stops defining a latching space therebetween; means pivotally coupling a first end of said base member to a first end of said incline member whereby said incline member may pivot between a wedging and a non-wedging position; a prop member having a first end pivotally coupled to said base member and a second end configured to fit within said latching space; and a latch mechanism coupled to said incline member including a striker biased towards said latching space and adapted to engage said prop member when said second end of said prop member is within said latching space.

4,501,445

METHOD OF IN-SITU HYDROGENATION OF CARBONACEOUS MATERIAL

Armand A. Gregoli, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Aug. 1, 1983, Ser. No. 518,987

Int. Cl.³ E21B *43/24, 43/26, 43/40*; E21C *41/10*

U.S. Cl. 299—2 **41 Claims**

40. A process for the recovery of carbonaceous materials from an underground formation, comprising:

(a) fracturing a portion of an underground formation, comprising carbonaceous material selected from the group consisting of coal, oil shale, tar sands, and heavy crudes,

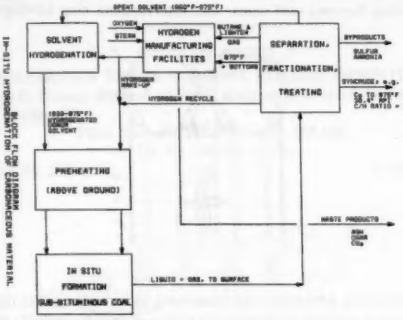
(b) contacting the carbonaceous material in-situ in the fractured formation with

(1) a preheated liquid solvent, wherein at least a portion of the liquid is a hydrocarbon-containing liquid having a boiling range of from about 300° F. to about 1200° F., and further wherein at least a portion of the liquid is a hydrocarbonaceous liquid having the property of donating and accepting hydrogen, and having a boiling range of from about 650° F. to about 975° F., and

(2) a preheated gas comprising at least 50 volume percent hydrogen, and

wherein the pressure in the fractured formation is maintained

at from about 200 psi to about 2000 psi, and the temperature is maintained at from about 500° F. to about 900° F., to produce



a product mixture of at least a partially hydrogenated carbonaceous material and dissolved carbonaceous material, and

(c) removing said product mixture from said formation.

4,501,446
REMOVAL OF FINE-GRAINED SEDIMENTS FROM WATER BODIES

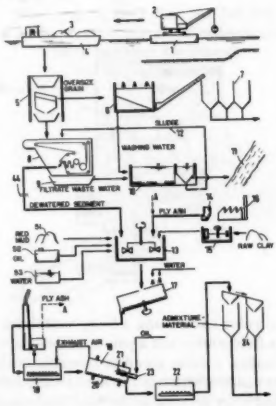
Eberhard Gläser, Aichwald-Krummhard, and Eberhard Beitinger, Stuttgart, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,624

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150993

Int. Cl.³ E02F *7/00*

U.S. Cl. 299—9 **30 Claims**



1. A method for removing fine-grained sediments from flowing or standing bodies of water comprising

dredging the segment from the bottom of the body of water;

classifying and dewatering the dredged sediment including the fine-grained material;

admixing to the dewatered sediment including the fine-grained material at least a fine-grained admixture material;

granulting the mixture;

drying the granulate;

firing the granulate under swelling; and

cooling the swelled, fired granulate.

4,501,447
HAULAGE DRIVE

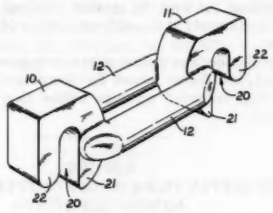
James P. Tatton, Carluke, and James Brownlie, Overtown, both of Scotland, assignors to Anderson Strathclyde PLC, Glasgow, Scotland

Filed Feb. 18, 1982, Ser. No. 349,965

Claims priority, application United Kingdom, Feb. 19, 1981, 8105188

Int. Cl.³ E21C *35/20*; F16G *13/07*

U.S. Cl. 299—43 **5 Claims**



1. A flexible chain free of hinger pins comprised of a plurality of link components adapted for interfitment with each other, each of said link components having complementary-shaped end parts of which each is the image of the other, each end part comprising a transverse recess which is open at one end, closed at the other end by a curved face and bounded by two parallel straight sides between an inner wall and an outer wall longitudinally disposed of each other, said outer wall is shorter than the inner wall, said outer wall having a straight end face parallel with the sides of the recess and an opposed end of a rounded configuration complementary so that when said end part of a first link component interengages with said end part of a second link component, said respective outer walls locate in said corresponding recesses, and parallel side braces extending between the inner walls of the end parts and spacing said end parts apart through integration therewith and having external surfaces spaced laterally beyond the width of said end parts.

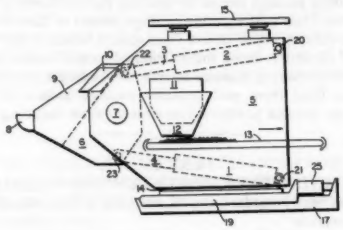
4,501,448
UNIVERSAL RIPPER MINER

Roger J. Morrell, Bloomington, and David A. Larson, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 3, 1983, Ser. No. 455,187

Int. Cl.³ E21C *29/30*

U.S. Cl. 299—67 **9 Claims**



1. A ripper miner comprising:

a movable cutter head having a cyclical cutting cycle transversing an arcuate angle of about 185° to less than 270° in a generally vertical plane;

a single material drag cutter having a bit holder and a single

removable material engaging bit insert therein, said drag cutter being mounted on said cutter head and extending therefrom; said drag cutter being movable with the head to engage the material to be cut with its removable bit during the cutting cycle;

frame means to mount the cutter head;

first means for moving the cutter head and drag cutter with respect to said frame means from its initial position in the aforesaid cyclical arcuate motion and then returning the bit to its original position to provide for the removable bit entrance and exit into the material to be cut at minimum depth of cut with the greatest depth of penetration being approximately at the midway portion of the cutting cycle; and

material collection and transfer means mounted on the cutter head and frame means for temporarily collecting and storing collected cuttings before they reach the mine floor.

4,501,449

FLUID SUPPLY FOR ROTARY CUTTER HEADS FOR MINING MACHINES

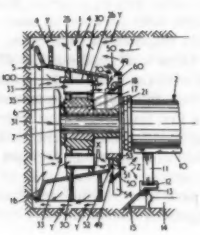
Brian A. Eagles, Johannesburg, South Africa, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 14, 1982, Ser. No. 418,084

Claims priority, application United Kingdom, Oct. 13, 1981, 8130807

Int. Cl.³ E21C *35/22*

U.S. Cl. 299—81 **16 Claims**



1. A fluid supply system for a rotary cutter head mounted on a rotary drive shaft of a mining machine, comprising an adaptor unit mounted on the mining machine, the adaptor unit defining inlet means for a relatively low pressure feed arrangement and further inlet means for a relatively high pressure feed arrangement, means defining separate passage means for feeding the relatively low pressure feed and the relatively high pressure feed from the inlet means and the further inlet means along the rotary drive shaft, distributor means mounted within the rotary cutter head for rotation therewith and defining first distributing passage means for feeding the relatively low pressure fluid from said separate passage means to first discharge nozzles positioned to direct fluid sprays towards the cutting zone of the cutter head, the distributor means further defining second distributing passage means for feeding relatively high pressure fluid from said separate passage means to second discharge nozzles positioned to emit air flow inducing sprays.

4,501,450

CONNECTING DEVICE BETWEEN TWO WHEEL RIMS

Pieter K. Mol, Noordzakweg 21, 4458 RA 's-Heer Arendskerke, Netherlands

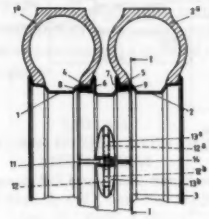
Filed Dec. 17, 1982, Ser. No. 450,599

Claims priority, application Netherlands, Jan. 19, 1982, 8200185

Int. Cl.³ B60B *11/02*

U.S. Cl. 301—13 SM **9 Claims**

1. A connecting device between two wheel rims, said rims comprising inner circumferential sides having facing edge portions each provided with a plurality of cams, and an intermediate ring which is provided coaxially between the rims and which has outwardly offset end edges in the shape of flanges extending beyond said cams, said intermediate ring having a



split and being provided with tensioning means adjacent to the split which operates to expand the split and thereby radially to expand the ring so as to cause the end edges of the ring to engage behind said cams, thus clamping the ring to the facing edge portions of the rims.

4,501,451

VEHICLE BRAKING SYSTEM

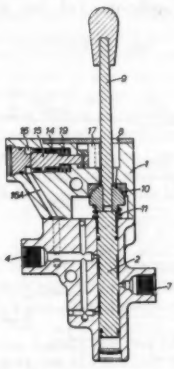
Desmond H. Reynolds, and Philip A. Taft, both of West Midlands, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 22, 1982, Ser. No. 435,932

Claims priority, application United Kingdom, Nov. 5, 1981, 8133451

Int. Cl.³ B60T *13/10*

U.S. Cl. 303—6 A **8 Claims**



1. A selector valve comprising a body with inlet means for connection to a fluid source and a pair of outlets for connection to respective brakes, a valve member movable in the body to control communication between the inlet means and said outlets, an operating lever pivoted to the body and coupled to the valve member for displacing the valve member, the operating lever having a central position in which both outlets are operatively connected to the inlet means and the operating lever being movable from said central position to opposed end postions in which a respective outlet is connected operatively to the inlet means, a linear guide slot in the body for guiding the lever to move in a plane between said end positions, and latching notches in a side edge of the slot adjacent the opposite ends of the slot, the lever being engageable in the notches to retain the lever releasably in a selected end position, and the lever being coupled to said valve member by an element extending laterally from the lever in said plane of movement and con-

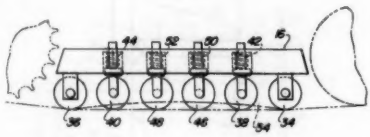
nected to the valve member by a universal joint, whereby movement of the lever laterally of the slot to engage and disengage the notches does not cause displacement of the valve member.

4,501,452

BULLDOZER TRACK SUPPORT ROLLER MOUNTING

Ray C. Huang, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 29, 1982, Ser. No. 445,346
Int. Cl.³ B62D *55/16*
U.S. Cl. 305—27 **5 Claims**



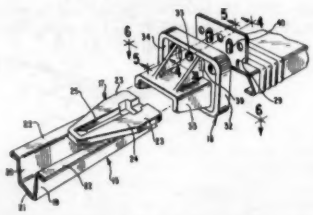
1. In a bulldozer track support system including a plurality of track rollers mounted along a longitudinally extending track frame, the impovement comprising: means resiliently mounting at least a central contiguous group of the rollers to the track frame such that the resistance of individual rollers of the group of rollers to vertical deflection increases as one proceeds oppositely from the center of the group towards front and rear ends of the track frame such that a given vertical force applied to the track rollers of said group will cause the latter to deflect to positions whereat a line drawn through their lowermost points is upwardly arched.

4,501,453

SLIDE ASSEMBLY FOR DRAWER

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035, and Jay S. Waxman, Skokie, Ill., assignors to Kenneth H. Gutner, Highland Park, Ill.

Filed Feb. 3, 1982, Ser. No. 345,332
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.³ A47B *88/04*
U.S. Cl. 308—3.6 **10 Claims**



1. A slide assembly for a drawer adapted to cooperate with a generally T-shaped guide on a dresser or the like comprising a metal slide member having a generally C-shape in transverse section extending over a major portion of its length to cooperate with said guide, said member at one end thereof being equipped with an integral upstanding tab adapted to be secured to the back panel of a drawer, said tab having an opening therethrough positioned centrally thereof, said opening being flanked by a pair of detent means,

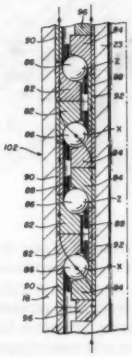
said slide assembly also including a plastic adapter element adjacent said one end and shaped also to cooperate with said guide, said adapter element having an integral bearing portion adapted to be received within said slide member C-shape and having an integral upstanding flange adapted to abut said tab, said flange being equipped with a central opening alignable with said tab central opening when said bearing portion is received within said C-shape for the joint receipt of a back panel securing screw, said flange also being equipped with a pair of slots alignable with said detent means.

4,501,454

METHOD OF DISTRIBUTING LOAD AMONG STACKED BEARINGS

James G. Dennis, Pottsboro; Kenneth W. Bramlett, Arlington, and G. C. Jackson, Jr., Dallas, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1983, Ser. No. 546,683
Int. Cl.³ F16C *19/10*
U.S. Cl. 384—619 **15 Claims**



1. In a drilling tool having an outer cylindrical member, an inner cylindrical member in radial spaced relation therewith, and bearing means for supporting said members for relative rotation and transmitting thrust load therebetween, said bearing means comprising:

a plurality of axially stacked rolling bearing assemblies, each assembly comprising an inner race attached to said inner member and an outer race attached to said outer member and rolling means disposed for rolling engagement with said races; and

means for distributing the thrust load on said rolling means of certain of said rolling bearing assemblies generally equally, said means comprising:

at least one of the races of each certain assembly being formed of a bearing material significantly softer than said rolling means whereby, whichever of said certain bearing assemblies that is subjected to the initial thrust load is readily worn to a condition that distributes the load to the certain assembly next subjected to the greatest thrust load which in turn is worn in accordance with the load received so that the wear of the races of each said assembly promotes equal distribution of the load therebetween.

4,501,455

LOCKING AND EXTRACTION MECHANISM FOR RACK MOUNTED COMPONENTS

John B. Groseck, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 15, 1982, Ser. No. 339,270
Int. Cl.³ E05B *1/00*
U.S. Cl. 312—215 **5 Claims**

1. A combined lock and extractor comprising

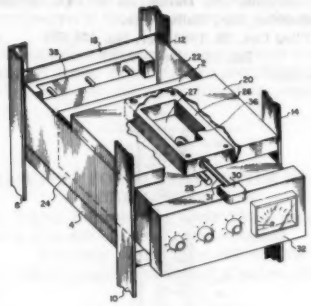
a handle selectively positionable between a first position and a second position,

a U-shaped hook having one end connected to said handle,

a lock block having an aperture extending therethrough,

support means for slidably supporting said hook in said lock block to enable a second end of said hook to contact a surface of said lock block within said aperture in said first position of said handle and to pass along an outside surface of said lock block in said second position of said handle and

mounting means for mounting said lock block in a support rack adjacent to a rack mounted apparatus located in said support rack whereby said first position of said handle is



effective to prevent removal of said rack mounted apparatus from said support rack and said second position of said handle is effective to allow a removal of said rack mounted apparatus from said support rack, said second end of said hook being arranged to contact said rack mounted apparatus in said second position of said handle to transmit a force applied to said handle to said rack mounted apparatus to assist in removing said apparatus from said support rack and said handle being arranged to contact a front face of said apparatus in said first position of said handle.

4,501,456

STORAGE RACK WITH MULTIPLE DRAWER COMPARTMENTS AND MOLD FOR MAKING SAME

Gerhard Schäfer, Neunkirchen, Fed. Rep. of Germany, assignor to Fritz Schäfer Gesellschaft Mit Beschränkterhaftung, Neunkirchen, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,083

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 8105516[U]

Int. Cl.³ A47B *88/06*

U.S. Cl. 312—273 **17 Claims**

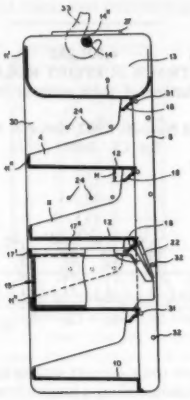
15. A storage rack comprising:

a frame having a base, a pair of sidewalls and a roof defining a space of rectangular vertical outline;

partition means in said frame dividing said space into a plurality of compartments;

a plurality of drawers each slidably received in one of said compartments, said drawers having a height less than that of the respective compartments; and

a stop member depending from the overlying roof into a front end of each compartment for engagement with a back wall of the respective drawer in a forward position of the latter while enabling an extraction thereof through said front end by a tilting motion about a free edge of said stop member, the rear end of each compartment being provided with a sill defining stop means for establishing an insertion position for the respective drawer while enabling the respective drawer to be extracted through said rear end upon being lifted above said sill, each compartment having a floor provided near the rear end thereof but forwardly of its sill with a boss of a lesser height than said sill engageable with a downward projection of an inserted drawer for preventing a forward sliding thereof from said



insertion position, said projection being receivable in a gap between said boss and said sill.

4,501,457

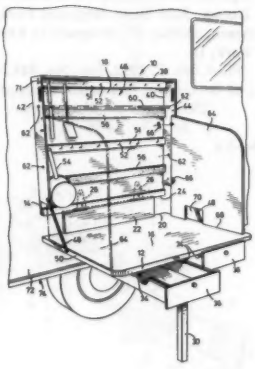
KITCHEN TABLE FOR CAMPER

Murray C. Pond, 294 Scottsdale Dr., Guelph, Ontario, Canada N1G 2K8

Filed Dec. 17, 1982, Ser. No. 450,671

Int. Cl.³ A47B *77/10, 37/04*

U.S. Cl. 312—314 **9 Claims**



1. A kitchen table collapsible as a storage unit, for use with a motor vehicle camper having an upright wall, comprising:

a unit having a pair of spaced panels with opposed inside surfaces when the unit is closed, outside surfaces, side edges and end edges, the panels being interconnected by hinge means at one side edge thereof for opening and closing the unit;

readily detachable means on a first of said panels adjacent said hinged side edge thereof for detachable engagement with support means on said wall;

at least one leg hingedly connected to the outside surface of said firs. of said panels remote from said hinged side edge and pivotably movable to a position normal thereto to support said first panel in a horizontal position as a table when also supported on said wall;

bracing means interconnecting said first panel and the sec-

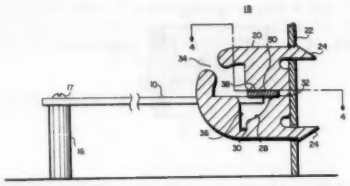
ond of said panels to support said second panel in a vertical position as a backboard when the unit is open; and means on the inside surface of said second panel for attaching cooking utensils thereto.

4,501,458

LOCKING HINGE FOR A PRINTED CIRCUIT BOARD

William R. Cubbage, Coloma, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Sep. 29, 1983, Ser. No. 537,779
Int. Cl.³ H01R *23/68*
U.S. Cl. 339—17 L **7 Claims**



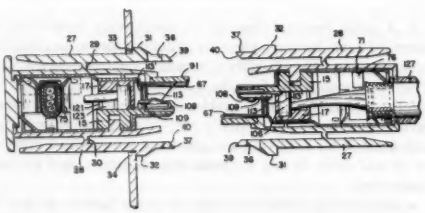
1. In combination:
a printed circuit board;
a pair of generally circular end pieces, each defining a concave guide track;
a pair of tabs affixed to one edge of said printed circuit board and engaging said guide tracks;
said end pieces and said tabs cooperating to permit confined pivotal movement of said printed circuit board between at least two distinct positions; and
said guide tracks each including two slots selectively engageable with said tabs by lateral movement of said printed circuit board for restricting further pivotal movement of said tabs and thereby defining two stable positions for said printed circuit board.

4,501,459

ELECTRICAL CONNECTOR

Curtis S. Chandler, Walkertown; Larry G. Novotny, Clemmons, and Elvert S. Watts, Walkertown, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 452,170, Dec. 22, 1982, abandoned.
This application Sep. 20, 1984, Ser. No. 652,430
Int. Cl.³ H01R *25/00, 13/54*
U.S. Cl. 339—48 **20 Claims**



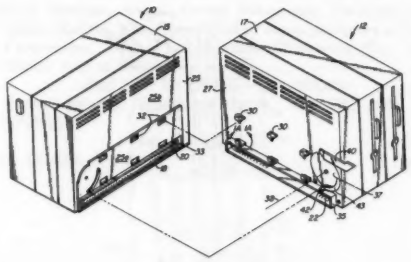
1. A hermaphroditic electrical connector comprising an insulating terminal housing having a front, mating face and a rear, wire connecting face, a plurality of terminals mounted in the housing with wire connecting portions at the wire connecting face and resilient contact tongues at the mating face, electrical shunt means mounted in the housing aligned with preselected contact tongues, the shunt means comprising two one-piece shunt bars located in tandem relation, each having a bridge portion extending transversely of all the contact tongues and a pair of spaced contact lugs extending from each bridge portion toward respective preselected contact tongues, the contact tongues being resiliently deformable from positions engaging the shunt means in an unmated condition of the connector to positions spaced from the shunt means in a mated condition of the connector by mating engagement with a complementary hermaphroditic connector.

4,501,460

MODULAR HOUSING FOR COMPUTER SYSTEM

John R. Sisler, Sunnyvale, Calif., assignor to Convergent Technologies, Inc., Santa Clara, Calif.

Filed May 9, 1983, Ser. No. 493,089
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—49 R **26 Claims**



1. In a system having first and second modules having cooperating pin and socket connector portions disposed along respective first and second walls, an improved latching mechanism for effecting engagement of said pin and socket connector portions while bringing respective external surfaces of said first and second walls into contact with one another comprising:
a plurality of hooking members carried on said second wall and having respective camming surfaces in spaced facing relationship to said second external surface;
portions of said first wall being formed with apertures corresponding to said hooking members and sized to accommodate said hooking members when said first and second external surfaces approach one another;
a latch bar having camming portions corresponding to said hooking members;
carriage means for mounting said latch bar to said first wall to allow movement of said latch bar between a first accommodating position wherein said latch bar does not obstruct said apertures in said first wall and a second capturing position wherein said camming portions cover at least portions of said apertures;
said camming portions of said latch bar cooperating with said camming surfaces on said hooking members so that movement of said latch bar from said first position to said second position causes said first and second external surfaces to be drawn into contact with one another; and
manually actuable means for effecting said movement of said latch bar, said means for effecting being operable at least when said hooking members enter said apertures.

4,501,461

ZERO INSERTION FORCE SOCKET

John W. Anhalt, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

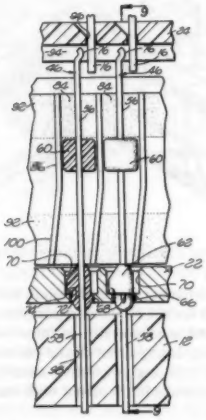
Filed Dec. 27, 1983, Ser. No. 565,560
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—75 M **18 Claims**

1. A socket for an integrated circuit carrier having a plurality of rows of conductive leads depending therefrom comprising:

a base plate and a top plate having a separate conductive partitioning structure therebetween slidable along a predetermined path relative to said base and top plates from a first position adjacent to one side of said plates to a second position adjacent to the opposite side of said plates;

said partitioning structure comprising a first set of parallel spaced metallic strips and a second set of parallel spaced metallic strips, said strips of said first set extending perpendicular to said strips of said second set thereby forming a plurality of rows of rectangular holes, said strips of said first and second sets being interleaved with each other and being securely mounted in a surrounding rectangular conductive frame to thereby provide a self-supporting assembly;

said strips of said first set being perpendicular to said predetermined path;



said base plate and said top plate containing apertures aligned with said holes;

contacts mounted in said apertures in said base plate extending upwardly through said holes;

said apertures in said top plate being adapted to receive therein said conductive leads of said circuit carrier with the leads spaced from said contacts on the side thereof opposite to said one side of said plates when said partitioning structure is in said first position whereby said leads may be inserted into the socket with essentially zero force;

a nonconductive element carried by each said contact within said partitioning structure; and

means for shifting said partitioning structure laterally along said predetermined path to said second position to cause the strips of said first set to push against said nonconductive elements to thereby bring said contacts into engagement with said leads.

4,501,462

COUPLING MEMBER FOR A CAPACITIVE MICROPHONE

Werner Fidi, Baden, Austria, assignor to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H, Austria

Filed Sep. 29, 1982, Ser. No. 427,561

Claims priority, application Austria, Oct. 15, 1981, 4433/81

Int. Cl.³ H01R *33/12*

U.S. Cl. 339—93 R **16 Claims**

1. A combination microphone capsule, preamplifier and coupling member for coupling the microphone capsule to the preamplifier, comprising:

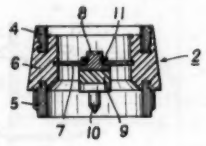
a microphone capsule;

a preamplifier;

a shaped body of vibration-absorbing elastic electrically conducting material connected between said capsule and preamplifier for forming a first conductive connection between said capsule and said preamplifier;

a contact pin connected between said capsule and preamplifier and including at least a portion made of vibration-absorbing elastic electrically conducting material, said contact pin extending axially in said shaped body for forming a second conductive connection between said capsule and said preamplifier; and

connection means connected to said shaped body for connecting one end of said shaped body to said capsule and an opposite end of said shaped body to said preamplifier;



wherein said shaped body has an axially extending opening therethrough, said coupling member including a diaphragm made of electrically insulating material and having an aperture therethrough said diaphragm mounted in said shaped body opening and connected to said shaped body, and abutting said contact pin for supporting said contact pin in said shaped body, said contact pin engaged in said aperture and spaced radially inwardly of said shaped body.

4,501,463

CABLE TERMINAL ELEMENT

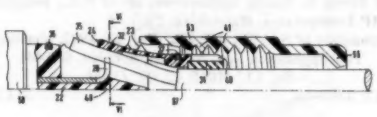
Josef Stebegg, and Gerhart Becke, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,583

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150568; May 27, 1982, 3220006

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **13 Claims**



1. A cable terminal element for operatively connecting an electrical cable having a plurality of conductors to an electrical device having a like plurality of terminal electrodes in the form of knife terminals for forming detachable connections to respective conductors of said cable, each of said knife terminals having at an end a substantially plate shaped flange provided with a notch for receiving and clamping a respective conductor of said cable during a connecting operation, said element comprising:

a substantially cylindrical support body having an axis of symmetry and provided with an external thread winding and a plurality of axially extending, circumferentially spaced slots equal in number to said knife terminals, each of said flanges being disposed, in a fully connected state of the terminal element, in a respective one of said slots and in a plane extending substantially perpendicularly to said axis;

an outer jacket in the form of a sleeve provided with an internal thread winding having the same thread pitch as said external thread winding for coacting therewith to screw said sleeve onto said body; and

camming means actuatable by said sleeve for shifting said conductors radially inwardly in said slots during a screwing of said sleeve onto said body, whereby each of said conductors is forced into the notch of a respective flange of said knife terminals.

4,501,464

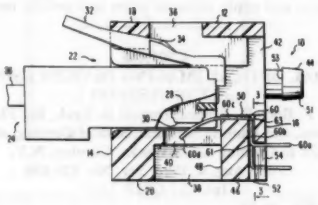
MODULAR CONNECTOR WITH IMPROVED HOUSING AND CONTACT STRUCTURE

Stephen B. Bogese, II, Salem, Va., assignor to Virginia Patent Development Corporation, Roanoke, Va.

Continuation-in-part of Ser. No. 215,054, Dec. 10, 1980, Pat. No. 4,457,570, which is a continuation-in-part of Ser. No. 120,846, Feb. 12, 1980, , which is a continuation of Ser. No. 915,457, Jun. 14, 1978, abandoned. This application Nov. 30, 1981, Ser. No. 326,133

Int. Cl.³ H01R *13/50*

U.S. Cl. 339;176 M **12 Claims**



1. A modular jack for directly coupling to a printed circuit board a modular plug of the type which includes a dielectric housing having a free end for insertion into the modular jack, a cord input end having a cavity for receiving a multi-conductor cord, a resilient locking tab integrally connected by a flexible hinge to the free end of the dielectric housing and extending obliquely rearwardly therefrom, a terminal-receiving side having partitions which define side-by-side slots in communication with the cavity, electrically conductive contact terminals positioned within the slots and extending into the cavity, the contact terminals including insulation-piercing tangs for making electrical engagement with associated conductors of the cord and upper edge portions for making electrical contact external to the plug, the modular jack comprising:

(a) an insulating housing having a front end, a rear end, a plurality of external walls, and means extending integrally from one of said external walls for mounting said insulating housing to the printed circuit board;

(b) plug-receiving opening means for receiving the modular plug extending into said front end of said insulating housing and having a plurality of internal walls;

(c) solder post means extending from said rear end of said insulating housing for insertion through alternating, staggered holes formed in the printed circuit board;

(d) a partition wall extending adjacent the rear portion of said plug-receiving opening means and having conductor-receiving means formed therein;

(e) a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising:

(i) an intermediate portion positioned in said conductor-receiving means in said partition wall;

(ii) a spring contact portion extending from said intermediate portion into said plug-receiving opening means from said rear portion of said plug-receiving opening means towards said front end of said insulating housing; and

(iii) an end portion extending perpendicularly beyond said one external wall to form said solder post means;

(f) said spring contact portions of said conductors engaging the upper edge portions of the contact terminals of the modular plug upon insertion of the plug into said plug-receiving opening means; and

(g) said plug receiving opening means further having recess means formed therein for receiving and releasably retaining the locking tab of the modular plug.

4,501,465

THREE-PIECE MULTICONNECTOR

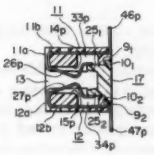
Mitsuo Hoshino, Atsugi; Osamu Fukushima, Kawasaki, and Toshio Kakuta, Higashiosaka, all of Japan, assignors to Sony Corporation, Tokyo and Hosiden Electronics Co., Ltd., Osaka, both of, Japan

Filed Nov. 19, 1982, Ser. No. 443,089

Claims priority, application Japan, Nov. 30, 1981, 56-178549[U]

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—176 MP **8 Claims**



1. A multiconnector comprising:

a first block of electrically insulating material substantially in the form of a rectangular parallelepiped;

a second block of electrically insulating material parallel to and in engagement with said first block to define therebetween an elongated insertion slot adapted to receive a removable companion connector at a front opening of said insertion slot;

an elongated third block of electrically insulating material fitted into said insertion slot to close the portion of said insertion slot opposite to said front opening;

joint means formed at both ends of said elongated third block integrally therewith for fixedly holding said first and second blocks therebetween;

said first block having an array of guide grooves formed in an inner wall surface thereof and extending parallel to one another in a direction transverse to the direction of elongation of said insertion slot;

a plurality of resilient conductors disposed parallel to one another adjacent respective ones of said guide grooves, a center portion of each of said conductors being buried by molding in at least a portion of said first block near the front opening of said insertion slot, one end portion of each of said conductors projecting outwardly from said first block and being folded to confront a corresponding one of said guide grooves thereby to form a contact portion, and the other end portion of each of said conductors projecting outwardly from said first block to form a terminal portion; and

locking means formed on said third block integrally therewith and extending parallel to said first block, said locking means being positioned to engage the free end of said one end portion of each of said conductors so as to cause the resilient force exerted by said conductors to urge said contact portions away from said first body.

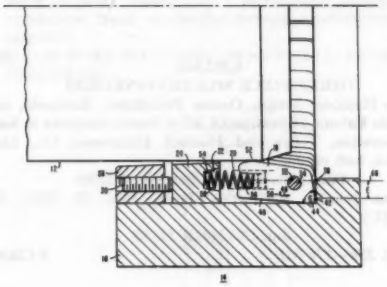
4,501,466
HIGH CURRENT CONTACT

Jeffry R. Meyer, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 288,609, Jul. 30, 1981, abandoned, which is a continuation of Ser. No. 801,122, May 27, 1977, abandoned. This application Dec. 6, 1982, Ser. No. 447,058

Int. Cl.³ H01R *13/12*

U.S. Cl. 339—255 P **9 Claims**



1. A resilient sliding contact comprising:

a cylindrical housing;

a plurality of independently movable contact fingers circumferentially arranged in said housing and adapted for sliding electrical contact with an associated conductor, each of said fingers comprising an end surface and a bottom surface both physically contacting said housing with said end surface and said bottom surface intersecting an an angle less than ninety degrees;

a like number of springs each fixedly attached at one end to one of said contact fingers; and

means connected to said housing for loading said springs to produce a bias force against each of said contact fingers, said bias forces each having a line of action generally parallel to the direction of relative motion between said contact fingers and an associated conductor and urging both of said contact finger end and bottom surfaces against corresponding surfaces of said housing to produce electrical contact therebetween, the point of contact between said finger end surface and said housing being offset from the line of action of said bias forces to produce contact pressure forces perpendicular to said lines of action.

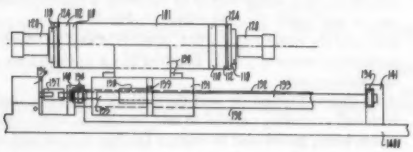
4,501,467
SCANNING SYSTEM EMPLOYING A LASER BEAM

Joseph J. Crane, Woodbridge, and Daniel T. Beasley, Springfield, both of Va., assignors to Crosfield Data Systems, Inc., Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 383,930

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.1 **13 Claims**



1. In a scanning system of the type have (a) a hollow housing; (b) a shaft in and supported by said housing; (c) scanning means carried by said shaft; and (d) means for rotating said shaft, said shaft having a first and a second end;

the improvement comprising:

means for improving the lateral stability of said shaft, comprising all of the following:

said housing defining a first and second spaced cavities, said cavities being spaced apart from each other

air pressure supply means for supplying air under pressure to said cavities,

said shaft including as part thereof and affixed thereto a first member located between the first cavity and said first end of said shaft, and a second member located between the second cavity and said second end of said shaft,

first element means located between said first cavity and said first member, said first element means for allowing a restricted air flow from said first cavity to pass to and apply pressure upon said first member, and

a second element means located between the second cavity and said second member, said second element means for allowing a restricted airflow from said second cavity to pass to and apply pressure upon said second member.

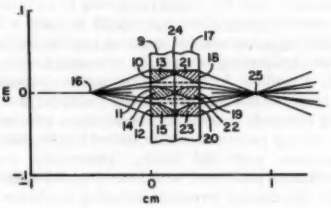
4,501,468
INTEGRAL OPTICAL IMAGING DEVICES USING GRIN LENS SYSTEMS

Nicholas F. Borrelli, Elmira; Donald B. Keck, Big Flats; David L. Morse, and Paul A. Sachenik, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,458

Int. Cl.³ G02B *5/17*

U.S. Cl. 350—96.25 **4 Claims**



1. An integral optical imaging device composed of at least two porous glass bodies each having an array of lens systems having the configuration of cylinders extending through the body, the lens systems having a prescribed gradient radial refractive index and being formed by photolysis of an organometallic compound in the glass pores, each cylinder terminating on opposite faces of the glass body in planar surfaces that function as lens-like elements, the glass bodies being rigidly maintained in a stacked relationship such that each lens system in one body is in registry with a corresponding lens system in the adjacent body, whereby the device has the effective thickness for imaging purposes of the two or more bodies.

4,501,469
MIRROR STRUCTURE FOR REFLECTING AND CONCENTRATING RADIATION ENERGY

Veit Merges, Putzbrunn, and Kurt Hummel, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,108

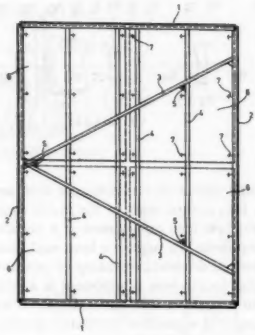
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3130471

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—611 **8 Claims**

1. In a mirror structure for reflecting and concentrating radiation energy, having a supporting framework including

flexurally stiff supporting members and mirror means adjustably attached to said frame work, the improvement wherein said mirror means comprise at least one flexible mirror, said mirror structure further comprising means for connecting said flexible mirror to said framework, said connecting means comprising at least one substantially planar carrying frame, first securing means operatively securing said carrying frame to said supporting framework at least at three points (5), and second securing means for adjustably and removably securing said flexible mirror to its planar carrying frame, said second



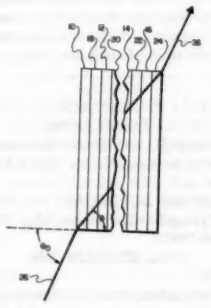
securing means comprising a pin (15), mounting means (19, 20, 21, 22, 23) for mounting one end of said pin in an axially adjustable manner to said planar carrying frame, and a fixture (16) including a defined stop surface (17) attached to a backside of said flexible mirror, said fixture (16) including friction fit means (18) in which the other end of said pin is inserted and held with a force determined by said friction fit means, whereby any vaulting of said flexible mirror is determined by inserting the other end of said pin into said fixture to an extent permitted by said defined stop surface (17).

4,501,470

CHRISTIANSEN-BRAGG OPTICAL FILTER

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 28, 1981, Ser. No. 306,115
Int. Cl.³ G02B *27/00, 5/20, 5/22*
U.S. Cl. 350—313 **6 Claims**



1. An optical bandpass filter for transmitting light in a narrow band around the wavelength λ_c, comprising:

a first series of layers having a refractive index n_1; and

a second series of layers having a refractive index n_2 and and alternating with said first series,

where n_1 and n_2 have a common value n_e at the wavelength λ_c but are different at other wavelengths and

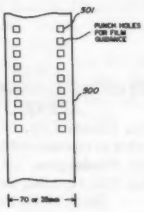
wherein each succeeding layer in said first series and in said second series is thicker than the preceding layer in said series such that said first and second series further comprise a series of layers of gradually increasing thickness.

4,501,471

AUTOMATED LIQUID CRYSTAL DISPLAY AND PROCESS

Bobby G. Culley, Wylie, and Kishin Surtani, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 167,909, Jul. 14, 1980, abandoned, which is a division of Ser. No. 43,068, May 29, 1979, Pat. No. 4,228,574. This application Jan. 29, 1982, Ser. No. 344,094
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—334 **4 Claims**



1. A liquid crystal display unit comprising:

(a) conductive electrode patterns on surfaces of first and second elongated strips of flexible transparent insulating film;

(b) an alignment layer on each of the patterned surfaces of said first and second film strips;

(c) said film strips oriented adjacent to each other with said electrode patterns on said two strips facing each other so that the electrode pattern on one strip is positioned opposite the corresponding electrode pattern on the other strip, to define pairs of corresponding electrode patterns;

(d) liquid crystal material and spacers between said two filmstrips and forming seals between said filmstrips so that said liquid crystal material is enclosed in volumes between said corresponding pairs of electrode patterns on said two filmstrips, in each enclosed volume said two filmstrips being separated by a predetermined distance defined by said spacers; and

(e) guidance means to facilitate automated handling on said first and second filmstrips.

4,501,472

TUNABLE ELECTROCHROMIC FILTER

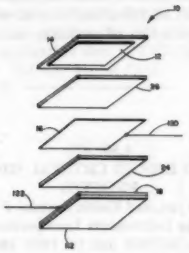
Margie M. Nicholson, San Marino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 327,856, Dec. 7, 1981, Pat. No. 4,456,337. This application Dec. 20, 1982, Ser. No. 451,294
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.³ G02F *1/23*
U.S. Cl. 350—357 **10 Claims**

1. A device, comprising:

an electronically isolated element of a solid, insoluble mate-

rial capable of reversibly changing optical state by reaction with soluble reactants; and



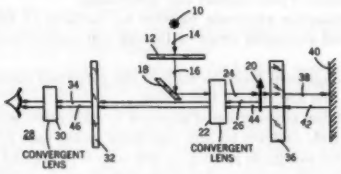
drive means for electrochemically generating said soluble reactants.

4,501,473

FRONT LIGHTED SHADOWGRAPHIC METHOD AND APPARATUS

William J. Stone, Kansas City, Mo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 11, 1982, Ser. No. 347,758
Int. Cl.³ G02B *5/30*
U.S. Cl. 350—407 **13 Claims**



1. Viewing apparatus for providing high contrast silhouette imaging of a substantially opaque object, comprising:

first polarizing means for polarizing a beam of light illuminating the object, the beam of light incident onto the front of the object,

said first polarizing means thereby providing a first polarization to light reflected by the object towards an observation station located in front of the object;

second polarizing means, located behind the object, for effecting a change in the polarization of any illuminating light bypassing the object and passing through said second polarizing means;

a reflective surface located behind the object and separated therefrom by said second polarizing means for reflecting light passing through said second polarizing means toward said observation station,

said second polarizing means and said reflective surface thereby providing at the observation station light which bypassed the object and which has a second polarization;

third polarizing means located in front of the object for reducing the intensity of observed light of one of said first and said second polarizations more than that of the other of said first and said second polarization,

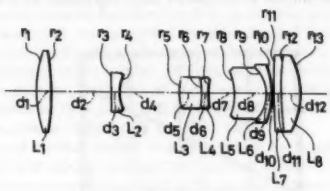
whereby frontally illuminated images of the object are observed in silhouette, with either the object or its background silhouetted against the other.

4,501,474

MICROSCOPE OBJECTIVE

Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,509
Claims priority, application Japan, May 4, 1982, 57-73374
Int. Cl.³ G02B *9/60, 21/02*
U.S. Cl. 350—414 **17 Claims**



1. A microscope objective comprising a first, second, third, fourth and fifth lens components in the order from the object side wherein said first lens component is a positive lens, said second lens component is a negative lens, said third lens component is a cemented doublet consisting of positive lens and a negative lens, said fourth lens component is a cemented doublet consisting of a positive lens and a negative lens, and said fifth lens component is a positive cemented doublet consisting of a negative lens and a positive lens, said microscope objective being arranged to fulfill the conditions (1) through (4) shown below:

$$0.25f < D < 0.35f \tag{1}$$

$$1.56 < \frac{n_1 + n_2}{2} \tag{2}$$

$$40 < \frac{\nu_1 + \nu_2}{2} \tag{3}$$

$$40 < \nu_5 - \nu_6 \tag{4}$$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol D represents the distance from the surface on the image side of the first lens component to the surface on the object side of the third lens component, reference symbols n_1 and n_2 respectively represent refractive indices of the first lens component the second lens component, reference symbols ν_1 and ν_2 respectively represent Abbe's numbers of the first lens component and the second lens component, and reference symbols ν_5 and ν_6 respectively represent Abbe's numbers of the positive lens and the negative lens which constitute the fourth lens component.

4,501,475

ZOOM LENS

Hisao Fujita, Hachioji, and Shozo Ishiyama, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,311
Claims priority, application Japan, May 25, 1981, 56-77935; May 25, 1981, 56-78658
Int. Cl.³ G02B *7/04*
U.S. Cl. 350—427 **9 Claims**

1. A compact zoom lens system comprising a first lens group having a positive focal length, a second lens group having a negative focal length, a third lens group having a positive focal length and a fourth lens group similarly having a positive focal length in the order from the object side, wherein a partial system consisting of the first lens group and the second lens group has a negative resultant focal length over the entire range of zooming, and when zooming is carried out from the

wide position to the tele position, the first lens group and the fourth lens group are moved towards the object, the second lens group is moved towards the image, and the third lens group is arranged so that an airspace formed between the third lens group and the second lens group is decreased and an airspace formed between the third lens group and the fourth lens group is also decreased, and further wherein a fifth positive lens group is arranged on the image side of the fourth lens group, said lens system satisfying the following conditions:

$$0.4fw < t_{1.2T} < 1.5fw$$

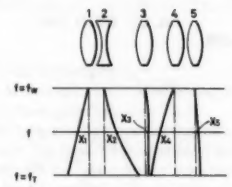
$$0.4fw < t_{2.3w} < 1.5fw$$

$$0.4fw < |f_2| < 1.5fw, \; f_2 < 0$$

$$0.3 < K_{4(f)} < 3$$

$$0.5f_T < f_5 < 5.0f_T$$

$$-0.5f_T < X_{5(f)} < 0.5f_T$$



where:

f: focal length as a whole at a suitable zooming position.

fw: f at the wide position

fT: f at the tele position

fi: focal length of the i lens group

Xi(f): amount of movement of the i lens group where focal length is f with the wide position as a reference; movement towards the object being positive, movement towards the image being negative

Ki(f): coefficient indicative of the ratio of amount of movement of the i lens group at the focal length f to the amount of movement Xl(f) of the first lens group, $Ki(f)=Xi(f)/Xl(f)$

$t_{1.2T}$: Airspace between the first and second lens groups at the tele position

$t_{2.3w}$: Air space between the second and third lens groups at the wide position, and

$t_{3.4w}$: Airspace between the third and fourth lens groups at the wide position.

4,501,476

DEVICE FOR CHECKING THE LIGHT SOURCE ADJUSTMENT IN AN INCIDENT LIGHT MICROSCOPE

Guenter Reinheimer, Biebertal, and Winfried Kraft, Asslar-Werdorf, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,798

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 8119559[U]

Int. Cl.³ G02B *21/00*

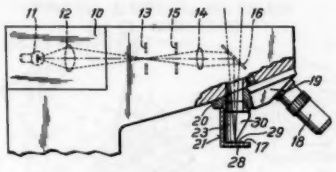
U.S. Cl. 350—520 **10 Claims**

1. A device for checking the adjustment of a light source in an incident light microscope having a revolving lens turret comprising:

a centering cylinder having the approximate shape of a lens cylinder;

a bottom plate located on the end of said cylinder facing an object to be observed with the microscope, said bottom plate occupying a position in the beam path corresponding approximately to the rear focal plane of a selected lens in the lens turret, and having at least one set of markings;

orifice means, provided on said centering cylinder, for permitting observation of said markings; and



means attached to said centering cylinder for mounting said centering cylinder in said revolving lens turret rotatably about an optical axis of said centering cylinder.

4,501,477

LENS ADAPTER FOR ENDOSCOPES

Yasumasa Sunaga, Iwatsuki, Japan, assignor to Fuji Photo Optical Co., Ltd., Ohmiya, Japan

Continuation of Ser. No. 217,470, Dec. 17, 1980, abandoned. This application Apr. 21, 1983, Ser. No. 487,149

Claims priority, application Japan, Dec. 26, 1979, 54-169586

Int. Cl.³ G02B *7/04*

U.S. Cl. 350—560 **3 Claims**

1. In combination: an endoscope having an optical fiber bundle with an entrance face at one end thereof and an exit face at the other end thereof, an eyepiece having a fixed focal length located adjacent said exit face for viewing an image appearing on said exit face, a wide angle objective lens adjacent said entrance face for focussing an image to be observed on said entrance face, and an adapter for varying the magnification of the image viewed through said eyepiece, said adapter comprising an adapter body, means for demountably attaching said adapter body to said eyepiece, said adapter also comprising an axially movable negative lens group, an axially movable positive lens group, and a fixed negative lens group, said groups being arranged in the above order away from said eyepiece and said exit face towards a viewer.

4,501,478

SCENE-START AND -END REFERENCE INDICATOR ARRANGEMENT FOR PROJECTOR STORING SCENE-START AND -END FRAME COUNTS

Gerd Mattes, Schorndorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 898,846, Apr. 20, 1978, Pat. No. 4,368,961. This application Feb. 13, 1980, Ser. No. 121,252

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717912

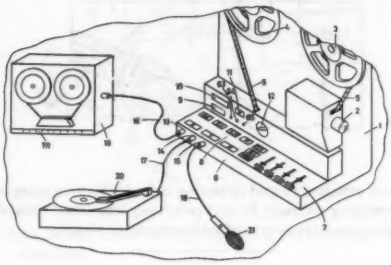
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.³ G03B *31/00*

U.S. Cl. 352—5 **3 Claims**

1. A sound film editor for projecting motion picture film forwardly and rearwardly and informing a user of a position of a projected film frame relative to scene starts and scene ends, comprising: an optical projection system projecting images on the film; a drive motor driving the film forwardly and rear-

wardly; a frame counter counting each frame on the film as an image thereon is projected by the optical projection system; a memory in which a predetermined frame count may be stored by a user, the predetermined frame count indicating a one of a scene start and a scene end; and a display including indicator



lamps arranged to cooperate with the frame counter and the memory and indicating when a count registered by the frame counter is lower than the predetermined frame count and further indicating when a count registered by the frame counter is higher than the predetermined frame count.

4,501,479

DEVICE FOR SAFETY-LOCKING A COVER OF A HOUSING OF A MAGAZINE OF A CAMERA AND CAMERA IN WHICH SUCH A DEVICE IS UTILIZED

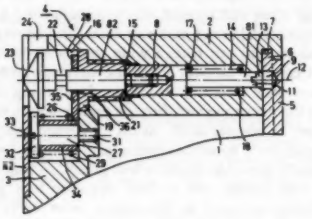
Pierre R. Lamoine, Ermont, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,753

Claims priority, application France, Apr. 23, 1982, 82 07011

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 **5 Claims**



1. A safety-locking device for a cover and a housing, said cover including means for positioning the cover on the housing, said means for positioning including first edges on the cover and second edges on the housing, one of said first and second edges including grooves provided for cooperation with the other of said first and second edges, said device comprising a safety-lock for the cover constituted by a shouldered shaft, said shouldered shaft mounted to slide between two extreme positions inside the housing against the biasing force of a first release spring in a direction substantially perpendicular to a portion of the cover from a first extreme unlocking position, a first end of said shouldered shaft being dimensioned and configured to penetrate into a recess provided in the cover under the influence of a force exerted on said shaft, blocking means being provided for automatically blocking said shouldered shaft in a second extreme locking position, in which a first end is received by said recess when the travel of said shouldered shaft between said two extreme positions in the housing reaches a predetermined distance, a second end of said shouldered shaft having a substantially conical form, said second end being flush with a portion of the wall of the housing opposite the cover in the first extreme unlocking position, a first groove being provided in the edge of the housing opposite the cover in order that a limited access to the second end is obtained.

4,501,480

SYSTEM FOR DEVELOPING A PHOTO-RESIST MATERIAL USED AS A RECORDING MEDIUM

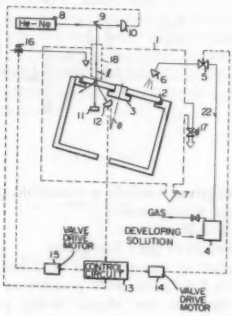
Fumio Matsui, and Mitsuaki Sashida, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,478

Claims priority, application Japan, Oct. 16, 1981, 56-153669[U]

Int. Cl.³ G03D *5/04*

U.S. Cl. 354—298 **4 Claims**



1. A system for developing a photo-resist material of a sensitive layer formed on a substantially transparent base, the sensitive layer having been exposed to a recording energy beam modulated in accordance with information to be recorded, the system comprising:

means for supplying a developing solution on the sensitive layer in atomized form so as to remove the exposed portions of the photo-resist material to form a series of pits which represents the information to be recorded;

means for supplying a monitoring energy beam of a predetermined wavelength on the sensitive layer of the base being developed, at an angle of incidence greater or smaller than 90°;

detection means for detecting the intensity of a diffraction beam of said monitoring energy beam passing through the pits, and producing a diffraction intensity signal proportional thereto;

control means for controlling the supply of the developing solution in accordance with said diffraction intensity signal;

a drive means for rotating said base during the developing process; and

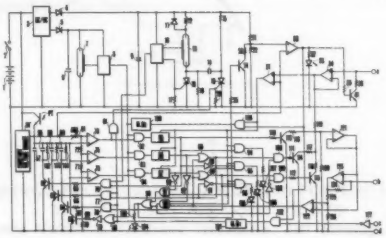
a cylindrical member for isolating a path of said monitoring energy beam from said developing solution disposed around said path of said monitoring energy beam for the entire length of said path, an end of said cylindrical member being open and facing said sensitive layer whereby preventing the atomized developing solution from adhering to said end.

4,501,481

FLASH PHOTOGRAPHING SYSTEM

Hiroyuki Kataoka, Saitama; Masanori Yamada, and Nobuyuki Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,214
Claims priority, application Japan, Dec. 4, 1981, 56-196031; Dec. 21, 1981, 56-207685; Jan. 9, 1982, 57-1904
Int. Cl.³ G03B 7/16, 15/02, 15/03
U.S. Cl. 354—413 22 Claims



1. A flash device, comprising:

(a) a distance detection circuit for detecting a distance to an object to be photographed;

(b) an aperture determining circuit arranged to determine an aperture value for flash photographing according to the distance detected by said distance detection circuit;

(c) an output signal forming circuit arranged to produce an output when the distance detected by said distance detection circuit is farther than a predetermined distance; and

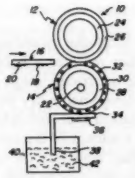
(d) a flashing circuit including a flash discharge tube and arranged to cause said flash discharge tube to flash at the time of flash photographing, said circuit being arranged to become inoperative in response to the output of said output signal forming circuit.

4,501,482

MEMBER OF COMPLIANT MATERIAL

Walter A. Stryjewski, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,979
Int. Cl.³ G03G 15/20
U.S. Cl. 355—3 FU 22 Claims



5. A member for fusing toner particles to a receiver by means of heat and pressure, said member comprising:

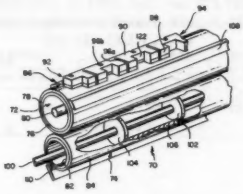
a compliant layer incorporating enclosed particles of material which are solid at non-fusing temperatures, which are fluid when heated to fusing temperatures, the fluid being contained within voids in said compliant layer formed by said particles to increase the compliancy of said compliant material at such fusing temperatures and which are resolidified within said voids when the material is cooled below said fusing temperatures such that said material is not consumed during fusing.

4,501,483

FUSER APPARATUS

John A. Romansky, Rochester, and Gary R. Matson, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,824
Int. Cl.³ G03G 15/20
U.S. Cl. 355—3 FU 9 Claims



1. In reproduction apparatus in which a support carrying an unfused toner image is moved along a path which is inclined to the horizontal transversely to the direction of movement of said support, fuser apparatus comprising:

a fuser member located adjacent to said path and having a fusing surface which contacts a support moved along the path; and

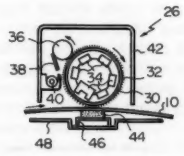
wick means at least partially overlying said fusing surface for applying release material which is fluid at fusing temperatures to said fusing surface, said wick means being inclined to the horizontal and including means for retarding release material from migrating along said wick means due to gravity.

4,501,484

PHOTOCONDUCTIVE ELEMENT CLEANING APPARATUS AND RESIDUAL TONER COLLECTING APPARATUS

Akira Shimura, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 10, 1982, Ser. No. 406,831
Claims priority, application Japan, Aug. 19, 1981, 56-123285[U]; Aug. 19, 1981, 56-130663; Aug. 19, 1981, 56-130662; Dec. 19, 1981, 56-189589[U]
Int. Cl.³ G03G 15/08
U.S. Cl. 355—15 16 Claims



1. A cleaning apparatus for cleaning a moving photoconductive belt to remove residual toner therefrom, comprising:

a rotatable cleaning member for removing the residual toner from the imaging surface of the belt;

a counter member located at the side of the belt opposite to the imaging surface to face the cleaning member through the belt; and

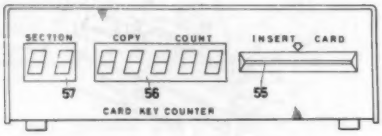
a support member for supporting the counter member and urging the counter member against the back surface of the belt while the apparatus is operated;

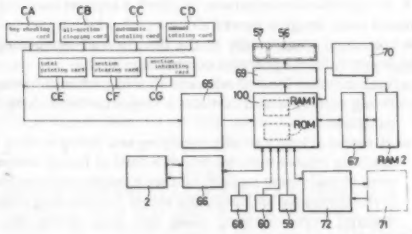
the cleaning member comprising a non-magnetic cylindrical sleeve having relatively short bristles set on the outer periphery thereof, and a plurality of magnets fixed in place within the cylindrical sleeve.

4,501,485
CARD-OPERATED COPYING MACHINE

Hideaki Tsudaka, Osaka, Japan, assignor to Mita Industrial Company Limited, Osaka, Japan

Filed Apr. 19, 1983, Ser. No. 486,541
Claims priority, application Japan, Apr. 19, 1982, 57-65624; Apr. 30, 1982, 57-74263
Int. Cl.³ G03G 15/00
U.S. Cl. 355—6 7 Claims





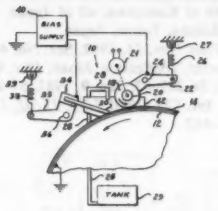
1. A card-operated copying machine comprising a processor responsive to information recorded on key checking cards assigned respectively to a plurality of sections for issuing signals capable of copying operation, memory means for storing total copy counts for the respective sections, display means for displaying the total copy count for each of said sections, said memory means having a flag indicative of permission and inhibition of copying operation for each of said sections, and an inhibition card recording thereon flag inhibition information for setting said flag to an inhibition state, said processor being capable of issuing a signal indicative of inhibition of copying operation in response to the key checking card for a section corresponding to a flag in the inhibition state.

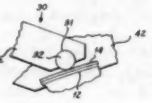
4,501,486
WIPER BLADE FOR ELECTROPHOTOCOPIER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,725
Int. Cl.³ G03G 21/00
U.S. Cl. 355—15 9 Claims

1. A blade for cleaning toner from an imaging surface, said blade having a body and having a tip which contacts said surface, said body being formed of a compliant material having



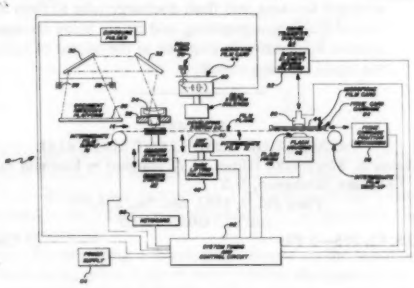


a relatively low bulk resistivity, and said tip being formed of a compliant material having a relatively high bulk resistivity.

4,501,487
MICROFICHE RECORDING APPARATUS AND METHOD WITH STATIONARY FILM HEAD

Mark H. McCormick-Goodhart, Grosse Point, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 15, 1983, Ser. No. 523,341
Int. Cl.³ G03B 27/32, 27/52
U.S. Cl. 355—27 14 Claims



1. A dry-process microfiche recording apparatus comprising an imaging station that reduces a light image to a microsize image and records the microsize image on a frame of predetermined size of a heat developable dry process intermediate film strip, a developing station that individually heat develops the microsize image into a microsize transparency image, an image transferring station that transfers the microsize transparency image to a dry-process microfiche film, said imaging, developing and transferring stations in fixed relation to each other, an intermediate film head in stationary relation to said imaging, developing and transferring stations, said intermediate film head for guiding said intermediate film strip to said imaging, developing and transferring stations, said intermediate film head including means for single frame advancement of said intermediate film strip after a microimage is recorded at said imaging station for allowing the next adjacent frame of said intermediate film strip to be microimaged and for moving the recorded frames of said intermediate film strip in single frame increments towards said developing and transferring stations, said intermediate film head including means for retracting the intermediate film at the end of a recording cycle to make

available to the imaging station for recording an image the next available area of the intermediate film strip, said imaging and developing stations spaced apart from the center-to-center of each other along said film track a distance of an integer multiple of the center-to-center distance of adjacent intermediate film frames, said developing station located between said imaging and transferring stations along said film head, said developing and said transferring stations spaced apart from the center-to-center of each other along said film track a distance of an integer multiple of the center-to-center distance of adjacent intermediate film frames.

4,501,488

IMAGE PROCESSOR AND METHOD FOR USE IN MAKING PHOTOGRAPHIC PRINTS

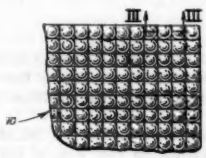
Morton Goldsholl, Goldsholl Associates, 420 Frontage Rd., Northfield, Ill. 60093

Filed Dec. 16, 1981, Ser. No. 331,296

The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.

Int. Cl.³ G03B *27/44*

U.S. Cl. 355—46 **10 Claims**



1. An image processor for use by photographers to produce special visual effects, said processor being adapted to be disposed in a stationary position against unexposed photographic enlarging paper while operating an enlarger, said processor comprising: a unit having a contact surface for direct engagement with the unexposed photographic enlarging paper while a primary image to be processed is projected by the enlarger to an opposite surface of said unit in closely spaced parallel relation to said contact surface thereof, said unit including an array of optical elements in side-by-side relation to each other and arranged to develop from portions of the primary image at said opposite surface a resultant image at said contact surface divided into contiguous modular portions with sharp lines of demarcation at the boundaries between contiguous modular portions, each modular portion being produced by one of said optical elements from a portion of the primary image which is aligned therewith and which is substantially separate from the portions aligned with adjacent optical elements, each of said optical elements being in the form of a lens element and said lens elements all having substantially the same focal length and being spaced a distance from said contact surface of on the order of said focal length but differing from said focal length to an extent such that each of said lens elements is effective to produce from an aligned portion of said primary image which is of non-uniform hue and intensity a modular portion of said resultant image which is of generally uniform hue and intensity, the transverse dimension of each of said optical elements being of a size large enough to permit said modular portions of said resultant image and said sharp lines of demarcation therebetween to be readily discerned when viewing the developed enlarging paper.

4,501,489

MULTI-PARTITION MODULAR CAMERA FOR OBTAINING MICROFICHES

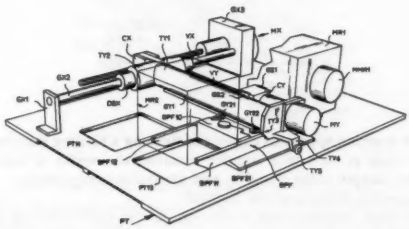
Claude Goulard, Meudon; Serge Accettella, Bourg-la-Reine; Gerárd Cathaly-Prétou, Fontenay-sur-Bois; Bernard Fages; Daniel Jeannin, both of Paris; Philippe Laloux, Neuilly-sur-Marne, and Jean Le Fur, Pantin, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Mar. 3, 1983, Ser. No. 471,724

Claims priority, application France, Mar. 4, 1982, 82 03570

Int. Cl.³ G03B *27/44*

U.S. Cl. 355—54 **9 Claims**



1. A microfiche camera arrangement comprising:

a frame;

a horizontal plate having a flat upper surface provided on the frame;

a light proof cover covering said horizontal plate;

a shooting station arranged in said horizontal plate;

a film holder unit provided under said cover and above said horizontal plate and adapted to support a photosensitive film in the vicinity of the upper surface of said plate;

first and second drive means for displacing said film holder unit in an indexed fashion above said shooting station along two horizontal perpendicular axes parallel to said upper surface of said horizontal plate, so as to allow the impression on the photosensitive film of a succession of elementary images arranged according to a partition selected from various elementary image partitions,

said first drive means including:

a longitudinal guide connected to said horizontal plate,

a transverse carriage comprising a first runner supported by said longitudinal guide, and

a first driving assembly coming into engagement with said first runner so as to displace said transverse carriage along said longitudinal guide,

said second drive means including:

a second runner provided on said transverse carriage and capable of displacement along said transverse carriage perpendicularly to said longitudinal guide, and

a second driving assembly engaging said second runner so as to displace said second runner along said transverse carriage, perpendicularly to the longitudinal guide;

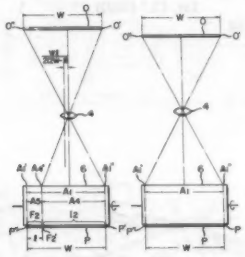
means for mounting said film holder unit on said second runner vertically free relative thereto; and

support riders provided on said film holder unit and capable of sliding with a dry fit on the upper surface of the plate.

4,501,490
COPYING APPARATUS

Koichi Miyamoto, Tokyo, and Yoshinobu Tonomura, Hachiohji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 378,742, May 17, 1982, abandoned. This application Jul. 3, 1984, Ser. No. 627,520
Claims priority, application Japan, May 21, 1981, 56-77070
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—55 **7 Claims**



1. A copying apparatus capable of forming a binding margin at an edge portion of a transfer medium, the width of said binding margin being variable, said apparatus comprising:

a movable photosensitive medium;

a variable magnification projection optical system having a lens for projecting the optical image of an original to be copied onto said photsensitive medium;

transfer means for transferring the image of the original to the transfer medium at a transfer station;

instructing means for instructing the formation of a binding margin on a side edge portion of the transfer medium and the width of the binding margin to be formed;

a first motor responsive to the instruction of said instructing means for displacing said lens in a magnification direction so as to change the magnification of the image of the original in accordance with the selected width of the binding margin; and

a second motor responsive to the instruction of said instructing means for displacing said lens in a direction perpendicular to direction of movement of the photosensitive medium by a distance corresponding to the selected width of the binding margin.

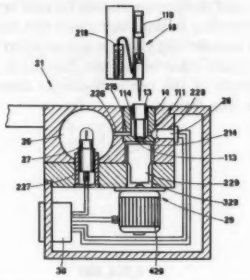
4,501,491
DEVICE FOR OPTICAL INDICATION OF THE PHENOMENA OF COAGULATION OF BLOOD, CONCENTRATION AND AGGREGATION OF BLOOD PLATELETS, OR THE LIKE

Enzo Breda, and Alfredo Ciotti, both of Udine, Italy, assignors to SALUS Ricerca e Sviluppo di CROCE' Dr. Francesco & C. Snc, Udine, Italy

Filed Mar. 10, 1982, Ser. No. 356,299
Claims priority, application Italy, Mar. 23, 1981, 83349 A/81
Int. Cl.³ G01N *33/48, 21/13*
U.S. Cl. 356—39 **5 Claims**

1. Indicator device for studying the phenomena of blood coagulation, concentration and aggregation of blood platelets including:

an indicator station defining a lengthwise groove, a plurality of spaced coaxial holes extending crosswise of said groove, a light positioned on a line coaxially extending from each end of a hole on one side of said groove, a photosensor means positioned in an end of each hole on the other side of said groove, a support means defining a plurality of parallel upright hollows for bearing test tubes slidable within said groove and defining coaxial crosswise holes communicating with said hollows and coaxially corresponding to said holes extending crosswise of said groove, said support means also defining holes in the bottoms of said hollows, a conveyor to move said support means to and from said indicator station, loading and

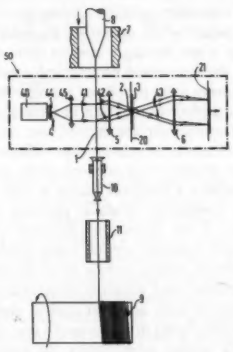


discharge means to insert into and remove said support means from said groove, stirring means positioned below each hole in the bottom of each hollow and an injector positioned above said support for loading said test tubes.

4,501,492
METHOD FOR TESTING SPECIMENS

Nikolaos Douklias, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,587
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126356
Int. Cl.³ G01N *21/84, 21/89*
U.S. Cl. 356—73.1 **14 Claims**

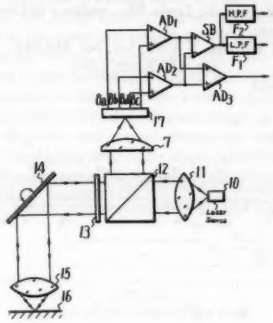


1. A method for non-destructive testing of fiber optical waveguides as to their tensile properties, said method comprising the steps of providing a specimen selected from a fiber optical waveguide and a preform from which a fiber optical waveguide is drawn; creating a spatial frequency spectrum of the specimen; filtering the spectrum to remove selected relatively stronger-appearing diffraction maximums of the spatial frequency spectrum by projecting the spectrum of the specimens onto a spatial frequency filter; and evaluating the component of the spectrum passing through the filter.

4,501,493
APPARATUS FOR DETECTING A POSITION OF AN OPTICAL PICKUP

Shigeo Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,214
Int. Cl.³ G01J 1/36
U.S. Cl. 356—123 10 Claims



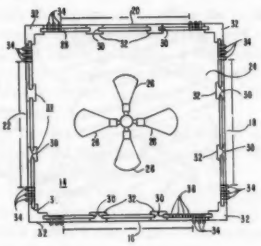
1. An apparatus for detecting a position of an optical pickup, comprising:

a lens having lens areas of four quadrants divided at two planes which are perpendicular to each other and intersect at an optical axis of the lens, focal lengths of said lens areas of first and third quadrants being equal to each other, focal lengths of said lens areas of second and fourth quadrants being equal to each other, the focal length of the lens areas in the first and third quadrants being different from that of the lens areas in the second and fourth quadrants, and said lens areas of equal focal lengths having axial symmetry about said optical axis, said lens being located within an optical path of a reflected beam from an optical disk; and a photo detector having four divided detecting portions in correspondence with respective lens areas of said lens for detecting the reflected beam passed through said lens.

4,501,494
APPARATUS FOR DETECTING DEFECTS IN CAPSULE SHELLS

Thomas G. Wood, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 3, 1982, Ser. No. 374,567
Int. Cl.³ G01N 21/16, 21/32
U.S. Cl. 356—240 9 Claims

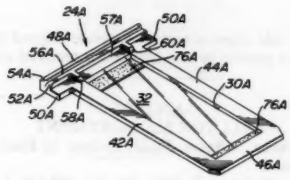


1. Apparatus for detecting defects in hard gelatin capsule shells comprising, in combination, an enclosed area which is defined by a plurality of external surfaces, a light source which is disposed within the enclosed area, and a plurality of transparent pegs mounted on at least one of said external surfaces and extending outwardly away from the enclosed area and light source, each of said pegs being dimensioned to snugly carry a capsule body or cap, whereby said light source is adapted to emit light which shines through said transparent pegs and capsule shells mounted on said pegs to show up defects in said capsule shells.

4,501,495
SLIDE CARRIER

Albert A. Faulkner, Conshohocken, and John C. Bouton, Doylestown, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 274,690, Jun. 17, 1981, Pat. No. 4,453,807.
This application Dec. 12, 1983, Ser. No. 560,471
Int. Cl.³ G01N 21/01
U.S. Cl. 356—244 13 Claims



12. A device for holding a specimen-bearing slide for location on an automatic microscope stage at at least one predetermined index position defined by a longitudinal position and a transverse position, said device including a tray having outer side margins provided by outer surfaces of peripheral top, peripheral bottom, peripheral leading and peripheral trailing sidewalls, a slide receiving window located within the periphery of the sidewalls of the tray, fastening means for securing a slide within the window, engagement means adjacent a side margin of the tray adapted to be engaged by cooperating drive means to move the tray longitudinally relative to the microscope stage to the predetermined longitudinally position, and an engagement surface on the tray adapted to be engaged by a cooperating alignment means for locating the tray in the predetermined transverse position, said top sidewall of the tray extending longitudinally beyond the leading and trailing sidewalls for providing opposed, laterally projecting ears adapted to be used to support the tray when said tray is stored in a generally vertical plane.

4,501,496
SPECIMEN SLIDE FOR ANALYSIS OF LIQUID SPECIMENS

Gladys B. Griffin, 848 S. Johnson Ct., Lakewood, Colo. 80226

Filed May 7, 1982, Ser. No. 376,252
Int. Cl.³ G01N 21/01
U.S. Cl. 356—246 18 Claims

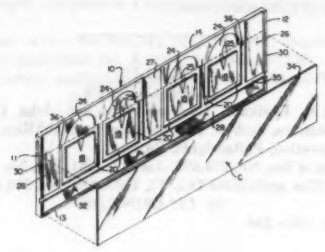
18. A specimen slide assembly adapted for examination of liquid specimens comprising in combination:

a slide plate having an upper, substantially flat examination surface, said examination surface including at least one viewing surface portion, a continuous channel disposed in surrounding relation to said viewing surface portion to isolate said viewing surface portion from the rest of said examination surface, said channel provided with a broadened recessed area in contact with a side edge of said viewing surface portion, said broadened recessed area defining a well to receive a liquid specimen and including a notched portion intruding into one side of said viewing surface portion;

a transparent cover plate; and

locating means on said examination surface of said slide plate

operative to support said transparent cover plate in predetermined spaced relation to said viewing surface portion



with a side edge of said cover plate aligned to partially expose a portion of said broadened recessed area.

4,501,497

CELL FOR MEASUREMENT

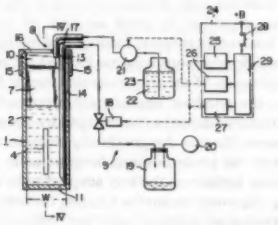
Yuzaburo Nanba, Saitama, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,626

Claims priority, application Japan, Aug. 28, 1981, 56-135245; Aug. 28, 1981, 56-135246

Int. Cl.³ G01N *1/10*

U.S. Cl. 356—246 **6 Claims**



1. A cell for optical measurement, comprising a cell for receiving a sample, said cell being wholly composed of rigid transparent rigid material, said cell having an opening at its upper end, said cell having a sample receiving chamber communicating with said opening and with a narrow thickness in the range of 2–0.5 mm as an optical pass length, said sample receiving chamber having a width of over several times said thickness, an attachment portion attached to the cell and comprising a holder plate freely settably and removably attached at the opening of said cell, said holder plate having an injection tube whose lower end faces said cell opening for injecting thereinto a cleaning liquid, said holder plate having an elongate suction tube extending through said cell opening and with its lower end reaching to the bottom of the sample receiving chamber, said holder plate having an injection opening communicating with the cell opening for placing therein the sample, a cleaning device connected to said attachment portion and having a timer circuit, said cleaning device having a cleaning liquid input line including a constant volume pump connected from a cleaning liquid source to said injection tube for injecting therethrough cleaning liquid into said sample receiving chamber, said cleaning device having a suction line comprising a suction pump connected through an electromagnetic valve to said suction tube for removing sample and cleaning liquids from said sample receiving chamber, said timer circuit having a first timer and a third timer operatively associated with said suction line for timing withdrawal from said sample receiving chamber of a measured sample and cleaning liquid respectively, said timer circuit having a second timer operatively associated with said cleaning liquid input line for timing injection of cleaning liquid into said sample receiving chamber, and a control circuit for controlling said three timers.

4,501,498

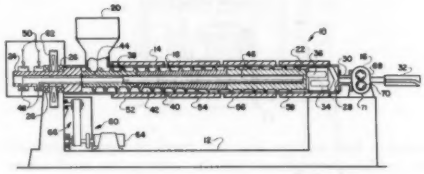
METHOD AND APPARATUS FOR EXTRUDING THERMOPLASTIC MATERIAL

James M. McKelvey, St. Louis, Mo., assignor to Luwa Corporation, Charlotte, N.C.

Filed Dec. 5, 1983, Ser. No. 558,042

Int. Cl.³ B29B *1/04*

U.S. Cl. 366—69 **24 Claims**



1. In a method of extruding thermoplastic material comprising passing said material successively through an extruder having rotating conveying screw means and a rotary gear pump, the improvement comprising operating said extruder and said pump at selected compatible speeds respectively to convey said thermoplastic material through said extruder with relatively little material pressurization in said extruder at said gear pump for relatively little heat generating mechanical working thereof while heating said material by conduction from said screw means to melt said material in said extruder primarily by heat transfer and to convey said melted material by said gear pump under pressure to a subsequent working station, whereby said material is extruded at a substantially greater rate and with substantially increased power economy and energy efficiency than without said selected operating or said heating from said screw means.

4,501,499

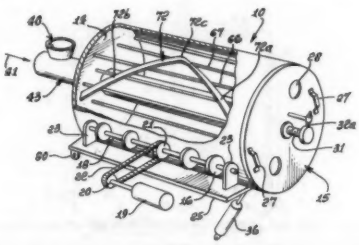
AGGLOMERATOR

William J. Boan, and Robert D. Coomes, both of Westminster, Calif., assignors to Purex Corporation, Lakewood, Calif.

Filed Sep. 15, 1983, Ser. No. 532,307

Int. Cl.³ B01F *9/06, 15/02*

U.S. Cl. 366—156 **10 Claims**



1. In an agglomerator, the combination comprising

(a) a drum having a longitudinal axis, and means for supporting and rotating the drum about that axis,

(b) feed means extending axially within the drum for feeding flowable material into the drum for longitudinal distribution and tumbling therein,

(c) rods carried by the drum to extend generally longitudi-

nally therein, certain rods located closer to said axis than other rods, the rods distributed about said axis, and said certain rods alternated with said other rods, about said axis,

(d) liquid spray means within the drum for spraying liquid into the flowable material tumbling within the drum interior,

(e) and including baffles carried by the drum in close proximity to the rods to extend along substantially the entire length of the drum interior and with helical angularity relative to the drum axis to deflect the tumbling material in directions toward the middle of the drum and,

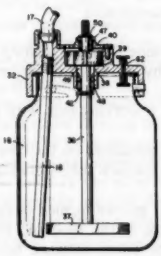
(f) said feed means including a tubular duct extending in an axial direction within the drum, a rotary feedscrew in the duct and individually adjustable size openings in the lower side of the duct, and spaced therealong, said adjustable size openings being defined by windows in the duct lower side, and gates moveable relative to said openings to control the sizes thereof.

4,501,500

PAINT CUP FOR SPRAYER

Joseph L. Terrels, 111 S. Bolmar St., West Chester, Pa. 19380

Filed Jan. 20, 1984, Ser. No. 572,650
Int. Cl.[3] B01F *7/16, 7/22*
U.S. Cl. 366—250 **9 Claims**



1. In combination with a hand-held spray gun for spraying paint and other coating materials, a reservoir for said material, aspirator tube means connected to said spray gun and extending to the bottom of said reservoir,

a cover assembly mounting said reservoir on said spray gun, said cover assembly including an impeller chamber, an agitator shaft mounting said impeller for rotation in said impeller chamber, and a bushing for said shaft in the bottom of said chamber having a bore open into said reservoir, said shaft extending through said bore into said chamber with sufficient clearance to permit limited air flow therethrough,

an air line for feeding compressed air to said gun having a branch conduit for admitting compressed air from said line into said impeller chamber,

valve means to regulate the air admitted to said chamber, said impeller chamber having discharge ports in an upper wall to afford primary discharge of said compressed air to atmosphere after driving said impeller,

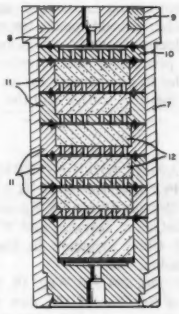
said agitator shaft terminating at its lower end in agitator blades adapted to sweep the bottom of said reservoir, said cover assembly including vent means extending through said cover, communicating said reservoir with the atmosphere, and pressure regulating means in said vent means to maintain the pressure within said reservoir to substantially equal the pressure of the atmosphere.

4,501,501

PROCESS FOR DISPERSING SOLIDS IN LIQUID MEDIA

Harold W. Edwards, Springfield, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 472,102, Mar. 4, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 598,185
Int. Cl.[3] B01F *5/06*
U.S. Cl. 366—336 **2 Claims**



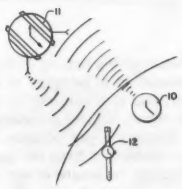
1. A process for the dispersion of particulate solids in liquid media comprising pumping a liquid premix containing an admixture of said solids and said liquid media through a plurality of orifices at a laminar flow velocity, there being sufficient pressure drop across said plurality of orifices to provide shear energy to cause said dispersion, the orifices being the network of tortuous paths formed from substantially nondeformable spherical particles arranged in a series of beds, each bed consisting of substantially spherical particles of a substantially uniform size in comprising at least one coarse bed of particles having a diameter of at least about 0.5 mm, at least one intermediate bed of particles having a diameter of about from 0.5 to 0.15 mm, and at least one fine bed of particles having a diameter of about from 0.15 to 0.05 mm, and wherein the flow rate of the liquid medium is adjusted to provide a shear rate, as measured assuming random packing of the spherical particles, of about from 1500 to 6300 sec^{-1} in each coarse bed, a shear rate of about from 3300 to 15,000 sec^{-1} in each intermediate bed, and a shear rate of about from 10,000 to 30,000 sec^{-} in each fine bed.

4,501,502

APPARATUS AND METHOD FOR TIMEKEEPING AND TIME CORRECTION FOR ANALOG TIMEPIECE

James Van Orsdel, 1917 Commonwealth Ave., Charlotte, N.C. 28205

Filed Jul. 21, 1983, Ser. No. 515,806
Int. Cl.[3] G04C *11/02*; G04B *19/04*
U.S. Cl. 368—47 **10 Claims**



1. A time synchronizer for an analog timepiece, comprising:

(a) a time source;

(b) means for transmitting a wireless electromagnetic signal from the time source at a pre-determined periodic time interval;

(c) an analog timepiece;
(d) means carried by said analog timepiece for receiving said electromagnetic signal and processing said electromagnetic signal into signal pulse;
(e) motive means cooperating with the hands of the analog timepiece and with the means for receiving and processing said electromagnetic signal to move the hands of the timepiece to the position to display the time indicated by the time source; and
(f) means for transmitting correction signal at a periodic interval, and wherein said means for receiving and processing said electromagnetic signal includes means for reviewing and processing said correction signal at given intervals in order to compensate for an accumulated time error between the time source and the analog timepiece.

4,501,503
THERMOGRAPHIC CHOLESTERIC COATING COMPOSITIONS AND PLATES

William L. Buirley, Dayton; Donald E. Koopman, Miami Township; David B. McQuain, Dayton, and William H. Reeves, Englewood, all of Ohio, assignors to Vectra International Corporation, Columbia, Md.

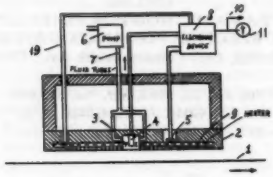
Continuation of Ser. No. 294,313, Aug. 19, 1981, abandoned, which is a division of Ser. No. 45,276, Jun. 4, 1979, Pat. No. 4,301,054. This application Jul. 27, 1983, Ser. No. 517,700
Int. Cl.³ C09K *3/34;* G01N *31/00, 33/00;* C09L *61/24;* B01J *13/02*
U.S. Cl. 374—162 **18 Claims**

1. A thermographic plate comprising a polymer film substrate sheet applied as a wet coat of about 6 to 12 mils thickness comprising a polymer film binding material, single-droplet microcapsules having transparent wall material and having core material consisting essentially of about 55 to about 75% of cholesteryl pelargonate, about 14 to about 35% of oleyl cholesteryl carbonate, about 2.0 to about 6.0% of cholesteryl propionate and about 4.5 to about 7.2% of cholesteryl chloride.

4,501,504
NON-CONTACTING MEASUREMENT OF SURFACE TEMPERATURE

Laszlo Urmenyi, 40 Thackeray Ct., Hanger Vale La., London W5 3AT, and William R. Urmenyi, 45 Lloyd Rd., Worcester Park, Surrey, both of England

Filed Aug. 25, 1982, Ser. No. 411,242
Int. Cl.³ G01K *1/16, 13/04, 17/08*
U.S. Cl. 374—164 **11 Claims**

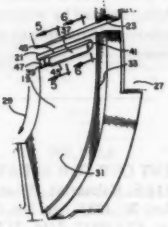


1. Method of non-contacting sensing of the surface temperature of an object consisting in bringing at least a part of the surface of a member, said part conforming generally in shape to the surface of the object, in close proximity to the surface of the object thereby forming a gap between the two surfaces, sucking up fluid, preferably air, from the gap into tube means and through a protective enclosure in the member, the fluid thus sucked up having acquired a temperature which is the arithmetic mean of the surface temperature of the object and the member, sensing the temperature of the sucked up fluid and the surface temperature of the member by using temperature sensing elements, utilising one of the temperature sensing elements to obtain an electrical signal which is a function of twice the temperature of the fluid and utilising the other temperature sensing element to obtain an electrical signal which is a function of the surface temperature of the member and combining the two signals so as to obtain a third signal which is a function of the difference between twice the temperature of the sucked up fluid and the temperature of the member, the said third signal being a measure of the surface temperature of the object.

4,501,505
THRUST BEARING

William S. Chambers, c/o Kingsbury, Inc., 10385 Drummond Rd., Philadelphia, Pa. 19154

Filed Jun. 6, 1984, Ser. No. 617,721
Int. Cl.³ F16C *17/06*
U.S. Cl. 384—152 **4 Claims**



1. A thrust bearing for use with a shaft having a collar mounted thereon, comprising
a base ring,
a thrust bearing shoe having a leading edge connected to a trailing edge by an inner diameter edge and an outer diameter edge,
said shoe having a working face with a bearing liner on its surface,
a series of shoes positioned on the base ring,
shoe pivot means on each shoe allowing the shoe to pivot in any direction,
an oil distribution groove formed in the working face near the leading edge of the shoe and extending radially for substantially the entire distance between the inner and outer diameter edges of the shoe,
said oil distribution groove having an inner end and an outer end connected by a leading edge and a trailing edge,
a bleed groove extending radially from the inner end of the oil distribution groove to the inner diameter edge of the shoe for supplying oil to the inner diameter area of the shoe downstream of the bleed groove which downstream inner diameter area would otherwise be starved of oil by the centrifugal inertial effects of rotating the collar,
an oil supply hole extending axially through the base ring near the outer diameter edge of the base ring,
an oil feed tube connected between the oil supply hole and the outer end of the oil distribution groove near the outer diameter edge of the shoe,
said oil feed tube having a near end with a ball shape and an annular recess with an O-ring seated in the recess, and a far end with a ball shape and an annular recess with an O-ring seated in the recess,
a socket formed in the shoe and connected to the oil distribution groove at its outer end for receiving the near end of the oil feed tube and its O-ring to seal the tube against oil leaks,
a socket formed in the base ring for receiving the far end of the oil feed tube and its O-ring to seal the tube against oil leaks,
shoulders formed at the openings to said sockets for retaining the ends of the tube in the sockets, and
a retainer pin extending radially from the shoe into an annu-

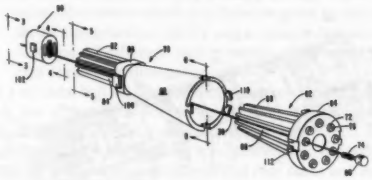
lar groove in the base ring to assist in retaining the shoe on the base ring.

4,501,506

DOT MATRIX PRINT HEAD

David E. Weeks, Newfield; John W. Reece, and Robert L. Wirth, both of Ithaca, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 25, 1983, Ser. No. 470,012
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **3 Claims**



1. A wire matrix print head comprising a
mounting plate having a plurality of electromagnets supported therefrom in a circular arrangement, an annular housing portion and a nose portion integral therewith, a
plurality of print wires each having one end thereof originating in the housing portion and supported within the nose portion and each having the other end thereof terminating at the end of said nose portion, a
plurality of armatures operably associated with the electromagnets and with said one ends of the print wires for driving the other ends of the print wires from a non-printing to a printing position, and
print wire guide means of generally conical shape and extending from the annular housing portion to a point approximately midway of the nose portion and including a first guide member having an annular portion formed for bearing said one ends of the print wires and having a grooved forward portion integral therewith and formed for directing the wires from a circular to an elliptical pattern and insertable into a second guide member of the guide means, said second guide member including a rearward hollow portion for receiving the grooved forward portion of the first guide member and having a grooved forward portion formed for directing the wires from the elliptical pattern to an aligned configuration, said first and second guide members forming a wire guide subassembly having the print wires contained therein and arranged for fitting into the nose portion of the print head, said guide means further including a tip portion for receiving the other ends of the print wires in aligned manner in the assembly of the print head and for supporting the other ends in printing operation.

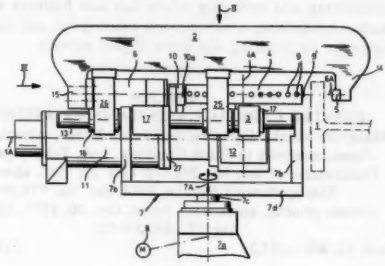
4,501,507

HEAVY-DUTY SELECTIVE EMBOSSING APPARATUS

Rolf Peddinghaus, Deterbergerstr. 25, 5828 Ennepetal, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,206
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240858
Int. Cl.³ B41J *1/32, 3/38*
U.S. Cl. 400—134 **9 Claims**

1. An apparatus for embossing an imprint in a workpiece, the apparatus comprising:
a rigid frame having a front end to one side of the workpiece to be embossed and a rear end to the other side thereof;
means supporting at least the front end of the frame for movement relative to the workpiece in a longitudinal direction which extends across the workpiece and between the front and rear frame ends;
an anvil on the front frame end and engageable with the one side of the workpiece;
a tool support;
means supporting the tool support on the frame for longitudinal movement relative to same and to the workpiece;
a tool wheel rotatable on the tool support about a transverse tool axis generally perpendicular to the longitudinal direction and having a periphery carrying a plurality of tools spaced angularly about the tool axis, the wheel being angularly displaceable through a plurality of respective



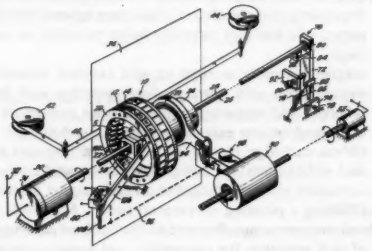
positions in each of which a respective one of the tools longitudinally forwardly confronts the other side of the workpiece in line longitudinally with the anvil;
drive means on the tool support for rotating the tool wheel about the tool axis through the respective positions; and
actuator means engaged backward against the rear end of the frame and engageable forwardly with the tool wheel at a location thereon diametrally relative to the tool axis opposite the tool confronting the workpiece, whereby the actuator means can expand longitudinally and pull the anvil back into engagement with the one side of the workpiece while pushing the wheel into engagement with the other side of the workpiece.

4,501,508

APPARATUS FOR USE IN AUTOMATIC TYPING MACHINE

John T. Potter, Locust Valley, N.Y., assignor to Iquad Company Incorporated, Locust Valley, N.Y.

Continuation-in-part of Ser. No. 310,189, Oct. 9, 1981, Pat. No. 4,440,038, and a continuation-in-part of Ser. No. 407,481, Aug. 13, 1982, Pat. No. 4,423,970, and a continuation of Ser. No. 190,680, Sep. 24, 1980, abandoned. This application Mar. 28, 1983, Ser. No. 479,633
Int. Cl.³ B41J *1/32*
U.S. Cl. 400—141.1 **7 Claims**



1. In a typewriter printing assembly comprising means for mounting type characters, shaft means along which said

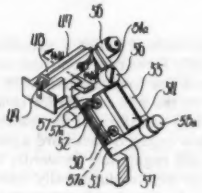
mounting means is moved, actuator means for moving said type characters from an at rest mode to a typing mode and follower assembly means for moving said mounting means and said actuator means along said shaft, said actuator means being mounted around said shaft in striking relation with said type characters, means connecting said actuator means to said follower assembly for movement therewith and means connecting said mounting means to said follower assembly for movement therewith, said last mentioned means providing interfitting parts between said mounting means and said follower assembly for securing the same together and for releasing the same from one another, means adjacent an end of said shaft for releasably securing said shaft in operative position, said means connecting said mounting means and said follower assembly means comprising a mortise and tenon joint and means are provided for securing said tenon in said mortise.

4,501,509

PRINTER CARRIAGE AND HAMMER ASSEMBLY

Masayuki Suzaki, Fujisawa, and Tetuo Kanno, Atsugi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 201,375, Oct. 27, 1980, abandoned. This application Feb. 16, 1984, Ser. No. 579,299
Claims priority, application Japan, Oct. 30, 1979, 54-150421
Int. Cl.³ B41J *9/02*
U.S. Cl. 400—157.2 **26 Claims**



1. A printer carrier and hammer apparatus for facilitating assembly thereof, comprising:

a frame wherein said carrier is mounted on said frame;

a platen for supporting a printing paper mounted on said frame such that said carrier is movable along said platen;

a carriage movably mounted on said carrier;

means for driving said carrier secured to said carriage;

a daisy-wheel type-head having a plurality of radially extending fingers including a plurality of characters formed on said fingers, said type-head being supported by said carriage such that said carriage facilitates replacement of said type-head;

a motor attached to said carriage and having a drive shaft for rotating said type-head so as to select one of said plurality of characters of printing;

means for mounting said type-head on said drive shaft;

a hammer assembly including a hammer for individually depressing said plurality of characters against said printing paper, said hammer assembly being mounted on said carriage;

a magnet assembly secured to said hammer assembly and mounted on said carriage for operating said hammer wherein said magnet assembly further comprises a substrate and an arm extending from said substrate;

a ribbon cartridge having an ink ribbon disposed therein, said ribbon cartridge being disposed on said carriage;

an armature pivotally mounted on said magnet assembly for effecting a pivoting movement; and

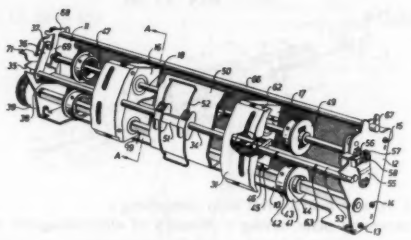
plural stopper means disposed at the limits of pivoting travel of said armature for contacting said armature to restrict said pivoting movement of said armature within a predetermined range, at least a first of said plural stopper means being mounted at an end of said arm of said substrate.

4,501,510

APPARATUS FOR FEEDING SHEETS OF MATERIAL AND CONTINUOUS WEBS IN PRINTERS AND TYPEWRITERS

Leif H. Andersson, Åtvidaberg, Sweden, assignor to Facit Aktiebolag, Åtvidaberg, Sweden

PCT No. PCT/SE82/00298, § 371 Date May 31, 1983, § 102(e) Date May 31, 1983, PCT Pub. No. WO83/01227, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 27, 1982, Ser. No. 503,368
Claims priority, application Sweden, Oct. 9, 1981, 8106001
Int. Cl.³ B41J *11/32*
U.S. Cl. 400—616.3 **10 Claims**



1. A feed mechanism for feeding a printer or typewriter with sheets of paper or with a continuous web having feed holes, said mechanism comprising friction drive means for frictionally engaging and driving the sheets of paper or the continuous web, means for driving the friction drive means including a first rotatable drive shaft, web feed means including a pair of pin wheels having projections engageable in holes in the web for driving the web together with the drive thereof by the friction drive means, said friction drive means including two separate feed units which are displaceable towards and away from one another in a direction perpendicular to the direction of feed of the sheets or web, each said unit including a friction drive wheel, said pin wheels also being relatively displaceable in a direction perpendicular to the direction of feed of the sheets or web, said web feed means and said friction drive means including means for selectively coupling said pin wheels with respective friction drive means in driving relation for the drive of the web, said rotatable drive shaft supporting said pin wheels and the friction drive wheels for common rotation therewith, each unit including a housing in which the respective friction drive wheel is arranged, and a second shaft having a square cross-section, said second shaft being turnable, said housing having a non-circular hole in which said second shaft is received for locking of the housing on said second shaft when the second shaft is turned towards one angular position in the non-circular hole and for releasing the housing when the shaft is turned towards a second angular position in the non-circular hole whereby to selectively lock the units.

4,501,511

BALL TYPE UNIVERSAL JOINT AND METHOD OF MANUFACTURE

Frank Albert, Jr., Parma, Ohio, assignor to Preformed Marine, Inc., Cleveland, Ohio

Filed May 26, 1981, Ser. No. 267,078
Int. Cl.³ F16D *1/12, 3/24*; F16C *11/06*
U.S. Cl. 403—24 **2 Claims**

1. A cable termination joint construction for preventing relative axial rotation and permitting articulating movement between a cable and an associated structure, the construction comprising:

(a) a housing to be mounted to the associated structure, the housing including:

(i) an interior surface portion which lies substantially on

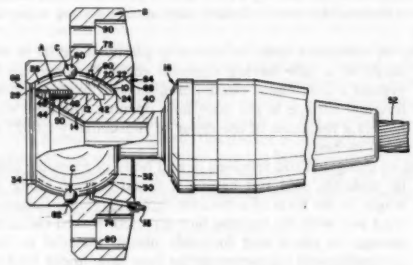
the surface of a sphere, the spherical interior surface portion defining a generally spherical cavity therein;

(ii) a first access opening defining portion for defining a first access opening in communication with the spherical cavity;

(iii) a second access opening defining portion for defining a second access opening in communication with the spherical cavity, the first and second access openings being disposed on opposite sides of the spherical cavity;

(iv) the second access opening defining portion further defining an enlarged, ball receiving passage extending through the second access opening into the spherical cavity, the ball receiving passage having a first transverse dimension which is at least as great as the diameter of the spherical cavity and a second transverse dimension of different size generally orthogonal to the first transverse dimension;

(b) a toroidal ball member baving an exterior surface portion which has a diameter that is less than the housing second access opening first transverse dimension and which is rotatably receivable in the housing spherical cavity, the ball member having generally parallel front and rear faces and defining an internal passage extending between the faces, the front and



rear ball faces being separated by less than the housing second access opening second transverse dimension;

(c) one of the housing and ball member defining a first bearing receiving recess in communication with the housing spherical cavity and the other of the housing and ball member defining an axially extending first bearing receiving slot in communication with the housing spherical cavity and with the first bearing receiving recess;

(d) a first bearing disposed partially in said first recess and partially in said first slot, such that the slot, recess, and bearing restrict relative rotational movement between the ball member and the housing while allowing articulating movement therebetween;

(e) a hollow shaft operatively connected with the ball member and extending through the first access opening, the hollow shaft defining an interior passage in communication with the ball member internal passage;

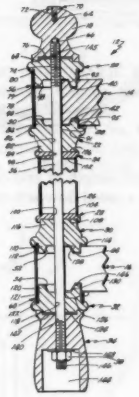
(f) a cable termination device for receiving and anchoring a cable, the cable termination device being operatively connected with the hollow shaft, at least a portion of the cable passing from the cable termination device, through the shaft interior passage through the ball member internal passage, through the housing second access opening, and into the associated structure.

4,501,512

FURNITURE ARTICLE WITH COMPRESSION HUB FOR JOINING RADIAL MEMBERS

Dale V. Hiltz, Comstock Park, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Dec. 7, 1981, Ser. No. 328,450
Int. Cl.³ F16B *7/00*
U.S. Cl. 403—170 **37 Claims**



1. An article of furniture comprising:

a tie-rod;

a first collar member and a second collar member, said collar members being adjustably mounted on said tie-rod and generally axially aligned so as to have a common axis with said tie-rod;

an elongated member having an end positioned between said first and second collar members and having an elongated terminal edge at its extreme end abutting said tie-rod, said elongated member extending radially from said tie-rod;

means for drawing said first and second collar members toward one another to secure said elongated member end therebetween;

means for urging said end of said elongated member radially inwardly toward a position immediately adjacent said tie-rod as said drawing means draws said first and second collar members toward one another for causing said elongated terminal edge to be forced and held tightly against said tie-rod; and

a sleeve member extending between said first and second collar members, said sleeve member including first and second sleeve ends and a wall defining an opening through which said elongated member end extends and is radially shiftable therein, said opening being dimensioned to support said elongated member against significant twisting with respect to said sleeve member.

4,501,513

METHOD AND APPARATUS FOR FORMING A HEAT EXCHANGE SYSTEM IN THE EARTH

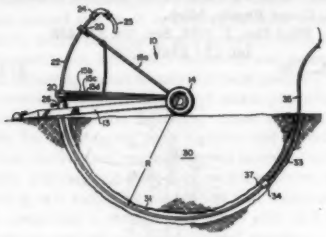
Bert J. Warner, and Joe F. Warner, both of 504 Towncreek Dr., Dallas, Tex. 75232

Filed Oct. 5, 1981, Ser. No. 308,862
Int. Cl.³ F16L *1/02*
U.S. Cl. 405—184 **18 Claims**

1. A method for forming a heat exchange system in the earth comprising:

(a) drilling a curved hole in the earth, the longitudinal axis of said hole lying along and defining an arc which, in turn, has a substantially constant radius of curvature whereby

both ends of said curved hole open through the surface at spaced points from each other;



(b) casing the entire length of said curved hole with a conduit to provide a cased flowpath completely through said hole.

4,501,514

SECURING OF STRUCTURES TO THE SEA-BED

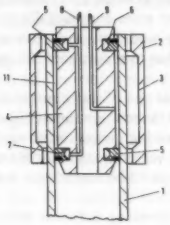
John M. Lowes, Dalton-in-Furness, England, assignor to British Underwater Pipeline Engineering, England

Filed Aug. 21, 1981, Ser. No. 295,075

Claims priority, application United Kingdom, Sep. 8, 1980, 8028940

Int. Cl.³ E02D *5/54*; B21D *39/04*

U.S. Cl. 405—227 **10 Claims**



1. A method of securing a structure to the sea bed which comprises placing the structure on the sea bed, inserting a tubular pile into the sea bed so that the tubular pile and a part of the structure form a pair of nested members comprising an innermost member and an outermost member, introducing into the innermost of the members a mandrel carrying, on its outer surface, inflatable means provided with reinforcement to prevent axial distortion of the same, and introducing a fluid into the interior of the innermost member so as to inflate said inflatable means and thereby define a sealed annular chamber between the outer surfaces of the mandrel and the inner surface of said innermost of the members while providing positioning of said reinforcement in the space between the outer surface of the mandrel and the inner surface of the innermost of the two members so as to prevent axial distortion of said inflatable means and to radially expand the chamber and thereby plastically deform said innermost member radially and cause it to engage with the outermost of the members so as to form a mechanical connection between the members.

4,501,515

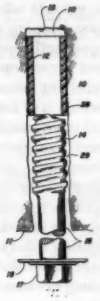
DYNAMIC ROCK STABILIZING FIXTURE

James J. Scott, Rolla, Mo., assignor to Scott Investment Partners, Rolla, Mo.

Filed Jun. 25, 1982, Ser. No. 392,234

Int. Cl.³ E21D *21/00*

U.S. Cl. 405—259 **5 Claims**



1. An anchor fixture for stabilizing geologic structure exposed in forming a mine passage in a geologic structure for recovery of material in such geologic structure, the exposed geologic structure having a bore hole of predetermined diameter to receive the anchor fixture, said anchor fixture comprising:

(a) an elongated body of formable plastic material in the shape of a tube having opposite edges that overlap to present a continuous circumferential wall to the circumferential surface in the bore hole opening, the tube wall having a thickness of the order of substantially 0.0625 to 0.125 inches;

(b) an elongated rod received in said body of formable plastic material, said rod having a raised surface along its length in the form of a buttress thread having a flattened crest and with the buttress face directed toward the mine passage to place said formable plastic material in full circumferential contact with the bore hole under load to exert a continuing supporting thrust by the formable plastic material between the bore hole circumferential surface and the buttress thread for establishing a dynamic system of vector forces radiating into the geologic structure;

(c) said elongated rod having a diameter as measured from the flattened crest of the buttress thread less than the diameter of the bore hole, and said body of formable plastic material having a wall thickness greater than the annular space between the bore hole surface and the flattened crest of said buttress thread, and said body of formable material being forced by insertion friction of said rod to flow into the buttress thread to assume the shape of the buttress thread on the inner surface of the formable plastic material and to react following rod insertion in compression between the flattened crest and root of the buttress thread and the surface of the bore hole for creating loading forces radiating into the geologic structure beyond the boundary immediately adjacent the bore hole;

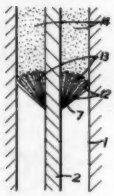
(d) a rigid structure support plate engaged on said rod and held thereby directly against the exposed geologic structure surrounding the bore hole, the engagement of the structural support plate against the exposed geologic structure reacting on said rod to exert axial tension in said rod and compression of the formable plastic material through the buttress face of the buttress thread such that a substantially continuous dynamic spiral wedge is created along the bore hole surface for supporting the geologic structure with a dynamic support pattern surrounding the bore hole adjacent the exposed structure and locking said rod in the bore hole with said rigid structural support plate

in position to oppose the tendency of the geologic structure to move.

4,501,516
ANCHORING OF TENSION MEMBERS

Bernhard Kotulla; Martin Weiser, both of Cologne; Jürgen Faltin, Roesrath; Lothar Preis, Cologne; Rudolf Schmidt, Burscheid, and Eberhard Born, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 340,417, Jan. 18, 1982, Pat. No. 4,443,132, which is a continuation of Ser. No. 048,298, Jun. 13, 1979, abandoned. This application Nov. 4, 1983, Ser. No. 548,741
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827327
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **2 Claims**

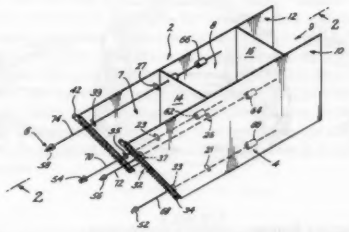


1. In a process for securing an anchor which can be prestressed and retightened in a borehole in rock, wherein a tension member is glued in the borehole by a reactive resin, the improvement wherein: the tension member is pushed with a packer comprising a pleated sheath into the borehole which is spaced from the end of the tension member in the borehole by a length corresponding to the length of the portion of the tension member to be glued; the packer is covered during the pushing of the tension member into the borehole to press it on the tension member; the cover is removed after the pushing step; and thereafter a reactive resin is injected into the borehole behind the packer.

4,501,517
SELF PROPELLED TRENCH SHIELD

Robert A. Seyle, 20230 F.M. 1488, Magnolia, Tex. 77355

Filed Sep. 16, 1982, Ser. No. 418,660
Int. Cl.³ B66F *1/04*; E02D *5/00*; E02F *3/24*; E21D *21/00*
U.S. Cl. 405—283 **10 Claims**



1. A trench shield for use in excavating an open trench in the earth, comprising:

an excavation box having sides;

anchor means for digging into the earth, said anchor means including resistant means for resisting the extraction of said anchor means from the earth by pulling;

at least one kelly, said kelly being connected to said anchor means; and

propulsion means connected to said kelly behind said anchor means and connected to said box for alternately forcing said anchor means into the earth and forcing said box to travel along said kelly toward said anchor means, said propulsion means including -

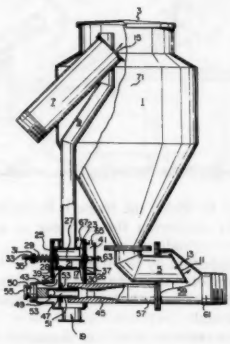
rotating means for engaging said kelly and rotating said kelly while forcing said kelly toward the earth in front of said helix,

drive means slidably mounted on said kelly for engaging said box and forcing said box along said kelly toward said anchor means.

4,501,518
AUTOMATIC PNEUMATIC FEEDER

Thomas G. Smith, Woodstock, Canada, assignor to Pneuveyor Systems Limited, Woodstock, Canada

Filed Dec. 10, 1982, Ser. No. 448,667
Claims priority, application Canada, Aug. 17, 1982, 409548
Int. Cl.³ B65G *53/28*
U.S. Cl. 406—25 **6 Claims**



1. A pneumatic material transfer apparatus comprising a sealed pod having an upwardly inclined material inlet pipe having an open upper end terminating inside said pod adjacent the upper end thereof and a resilient flap valve closing said upper end, a horizontal material outlet pipe having a resilient second flap valve and discharging into a discharge chamber below said pod, and a pneumatic operating system comprising a valve chamber, a control pipe communicating between the interior of said pod and said valve chamber, the upper end of said control pipe opening into said pod adjacent the top thereof, said valve chamber having first and second valve seats, first and second discs associated with said valve seats, said discs being mounted on a valve stem such that when said first disc is closed on its seat, said second disc is open from its seat, said first disc being fixed to said valve stem, and said second disc being slidable thereon, spring bias means urging said second disc toward said first disc, stop means on said valve stem limiting the motion of said second disc toward said first disc, a pressurized air supply chamber connected to said valve chamber by said first disc and a vacuum chamber connected to said valve chamber by said second disc, an induction throat between the pressurized air supply chamber and the discharge chamber, and an open ended nozzle positioned within and spaced from said throat, said nozzle having an opening within said vacuum chamber, a pilot valve connected between said pressurized air supply chamber and a valve control chamber adjacent said first disc, a first diaphragm forming a flexible wall between said valve chamber and said valve control chamber, permitting motion of said first disc between open and closed positions under control of pressure in said valve control chamber, a second diaphragm adjacent said second disc and slidable on said valve stem therewith and forming a flexible wall between said vacuum chamber and the atmosphere, said pilot valve having two positions, a first position connecting said

valve control chamber to said pressurized air chamber, and a second position venting said valve control chamber to atmosphere.

4,501,519

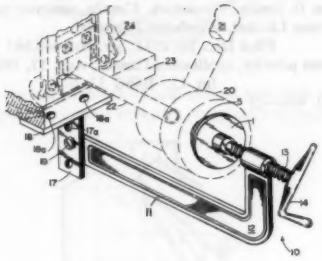
THREADING DIE COUPLE

Harry I. Leon, 924 Bowen St., N.W., Atlanta, Ga. 30318

Continuation-in-part of Ser. No. 153,083, May 27, 1980, Pat. No. 4,349,931. This application Aug. 12, 1982, Ser. No. 407,459

Int. Cl.³ B23G *5/04*

U.S. Cl. 408—101 **10 Claims**



1. A tool couple for a threading die, which comprises:
(a) a frame;
(b) a tailpiece to which the frame is connected;
(c) means for anchoring the tailpiece in a fixed position relative to a cylindrical workpiece;
(d) a shaft supported by the frame;
(e) means connected to the frame for moving the shaft along the longitudinal axis thereof in a direction toward the workpiece; and
(f) a rotatable member which is supported by the shaft; a portion of the member being slidable about the shaft; the member having a protrusion generally in the shape of a frustrum of a right circular cone generated by rotating a right triangle having a shorter leg about said shorter leg, a portion of the protrusion being tapered from wide to narrow in a direction toward the leading edge of the rotatable member and being adapted for physical contact with the frame of the threading die, so that a force can be transmitted from the tool couple through the frame of the threading die to points on the cutting edges thereof which are in contact with the workpiece, the axial component of said force at each point on the surface of the protrusion being pressed against the frame of the die exceeding the transverse component of the force at the same point, the transverse component being nevertheless sufficient to cause the rotatable member to center itself generally with the axis of rotation of the die even when there is considerable misalignment between said axis of rotation and the axis of rotation of the rotatable member.

4,501,520

EXPANSION DOWEL ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

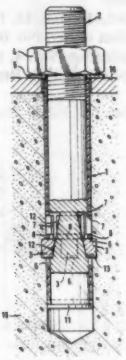
Filed Jul. 16, 1982, Ser. No. 398,827

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 3128610

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—21 **18 Claims**

1. An expansion dowel assembly comprising an axially elongated support tube having a leading end arranged to be inserted first into a borehole into which the assembly is to be anchored and a trailing end, an axially elongated anchor rod having a leading end and a trailing end with said anchor rod located within said support tube with the trailing end thereof extending axially out of the trailing end of said support tube, means engageable with the trailing end of said anchor rod for effecting axially displacement of said anchor rod relative to said support tube when the assembly is to be anchored within a borehole, said support tube having a support surface thereon extending transversely of the axial direction thereof and located between the leading and trailing ends thereof, expansion elements mounted within said support tube and in bearing contact with said support surface thereon, said anchor rod is



engageable with said expansion elements for radially displacing said expansion elements outwardly from the outside surface of said support tube when said anchor rod is displaced toward the trailing end of said support tube relative to said support tube, wherein said support surface comprises a transverse web yieldable in the axial direction of said support tube when a predetermined force acting axially on said anchor rod is exceeded.

4,501,521

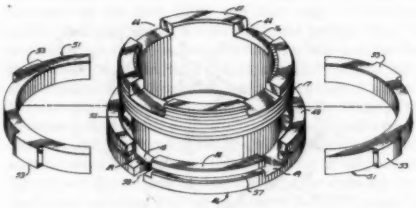
LOCKING FASTENER ASSEMBLY

Bela A. Geczy, Orange, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 5, 1982, Ser. No. 365,633

Int. Cl.³ F16B *39/06*

U.S. Cl. 411—217 **15 Claims**



1. A locking fastener assembly comprising:
a locking fastener having threads for assembly with an outer member and means at one end for engaging an inner member and preventing rotation of such an inner member relative to the fastener;
a ring on the fastener having projections engaging the fastener for preventing relative rotation between the ring and fastener, the ring having locking means and being axially slidable on the fastener between an unlocked position spaced away from such an outer member and a locked position having the locking means in engagement with

such an outer member for preventing relative rotation between such an outer member and the ring; and

means for temporarily retaining the ring in the locked position.

4,501,522

MANIPULATOR

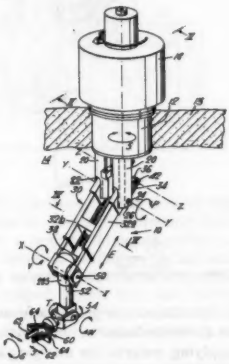
Roy Causer, Wantage, and Donald Orr, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 4, 1982, Ser. No. 432,759

Claims priority, application United Kingdom, Oct. 26, 1981, 8132260

Int. Cl.³ B25J *3/04*

U.S. Cl. 414—4 **17 Claims**



1. A manipulator including a slave arm comprising, a support means defining a first pivotal connection; an upper arm portion of the slave arm arranged to be supported by the first pivotal connection at an intermediate position along the length of the upper arm portion, and defining a second pivotal connection at one end of the upper arm portion and defining a movable connection at or near the other end of the upper arm portion, the axes of the first and of the second pivotal connection being substantially parallel; a forearm portion of the slave arm connected at one end to the second pivotal connection; pivoting means connected to the movable connection for pivoting the upper arm portion about the first pivotal connection, and drive means for moving the pivoting means; the distances of the second pivotal connection and of the movable connection from the first pivotal connection being variable but such that the ratio of the distances between the first and the second pivotal connections and between the first pivotal connection and the movable connection, is maintained substantially constant, and the slave arm being arranged so that pivotal movement of the upper arm portion about the first pivotal connection produces pivotal movement of the forearm portion about the second pivotal connection through the same angle as the pivotal movement of the upper arm portion but in the reverse direction.

4,501,523

APPARATUS FOR FEEDING PLATELIKE WORKPIECES TO A MACHINE TOOL

Ludwig Haider, Ennsdorf, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 8, 1983, Ser. No. 483,104

Claims priority, application Austria, May 19, 1982, 1987/82

Int. Cl.³ B65H *5/08*

U.S. Cl. 414—19 **9 Claims**

1. In apparatus for feeding platelike workpieces, comprising

a horizontal feed deck,

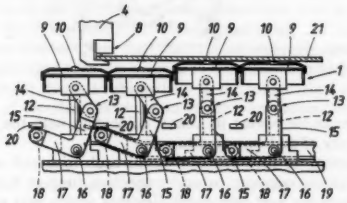
a carriage track extending in a first horizontal direction and carried by said feed deck and movable thereon in a second horizontal direction, which is transverse to said first direction,

a carriage, which is carried by and movable in unison with and along said carriage track,

gripping tongs carried by said carriage and adapted to connect a workpiece to said carriage so that said workpiece is movable with said carriage in said first and second directions,

a plurality of workpiece-supporting elements carried by said feed deck and vertically adjustable relative thereto and arranged in a plurality of rows, which extend in said first direction and are spaced in said second direction,

a plurality of horizontal actuating shafts, each of which extends in said first direction and is operatively connected to said workpiece-supporting elements of one of said rows and rotatable to vertically adjust said workpiece-supporting elements of said row,



a plurality of crank arms, each of which is non-rotatably connected to one of said actuating shafts, and

a cam bar, which extends generally in said second direction and is rigid with said carriage track and adapted to cooperate with said crank arms and to rotate successive ones of said actuating shafts as said carriage track is moved in said second direction,

the improvement residing in that

said feed deck comprises a plurality of crossbeams, which are individually vertically adjustable and extend in said first direction and are spaced in said second direction,

said workpiece-supporting elements of each of said rows are carried by one of said crossbeams, and

each of said actuating shafts is operatively connected to one of said crossbeams by a toggle joint comprising a first lever, which is non-rotatably connected to said actuating shaft, and a second lever, which is pivoted near one end to said first lever and near its other end to said crossbeam.

4,501,524

DRILL STRING ELEMENT HANDLING APPARATUS

Toyohiko Yoan, Osaka, and Norishige Muto, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,944

Claims priority, application Japan, Jun. 14, 1982, 57-100690

Int. Cl.³ E21B *19/14*

U.S. Cl. 414—22 **4 Claims**

1. An apparatus in a drill rig for moving drill string elements between a drill string element magazine and a drill string and for connecting and disconnecting said drill string elements to and from said drill string, comprising:

an elongated guide member;

a drifter movably mounted on said guide member for reciprocable movement therealong;

a plurality of drill string elements for making up a drill string;

a ring member rotatably mounted on said guide member;

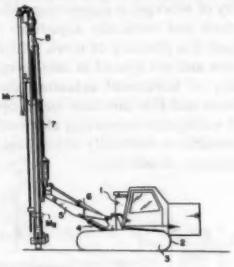
a magazine for storing said drill string elements, said magazine being fixedly secured to said ring member and having

formed therein a plurality of support holes for said drill string elements;

a plurality of stoppers each mounted to said ring member at a position diametrically opposite to said respective support holes relative to a rotary center of said ring member;

means for rotating said ring member around said guide member wherein the centers of each of said support holes and a projection of a center of said drill string are on a common circle having its center coinciding with the rotary center of said ring member; and

a plurality of first cylinder means each mounted on said magazine opposite to said respective support holes for supporting said drill string elements within said support holes, and locking means including a second cylinder for engaging said stoppers and locking said magazine at a predetermined position.



4,501,525

SINGLE POINT MOORING SYSTEM PROVIDED WITH PRESSURE RELIEF MEANS

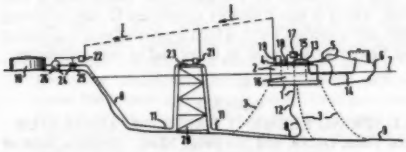
Andrew K. Grundy, and Jan Versluis, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 8, 1983, Ser. No. 473,388

Claims priority, application United Kingdom, Mar. 17, 1982, 8207830

Int. Cl.³ B65G *67/60*

U.S. Cl. 414—139 **10 Claims**



1. A single point mooring system for loading and unloading ships comprising a rotatable mooring element, a flow line for establishing liquid communication between liquid supply facilities and a ship moored to the rotatable mooring element, a passage for establishing liquid communication between the flow line and a liquid collecting reservoir on the rotatable mooring element, pressure relief means adapted to open the passage when the liquid pressure in the flow line reaches a predetermined critical value, a detector in the passage adapted to detect the occurrence of liquid in the passage, a signal transmitter connected to the detector and adapted to transmit a signal to a signal receiver in response to detection by the detector of said occurrence, and flow control means connected to the signal receiver and operative to control liquid flow through the flow line in response to the signal received by the signal receiver.

4,501,526

APPARATUS FOR CONVEYING A SOLID OR LIQUID MATERIAL, ESPECIALLY FOR CHARGING A SHAFT FURNACE

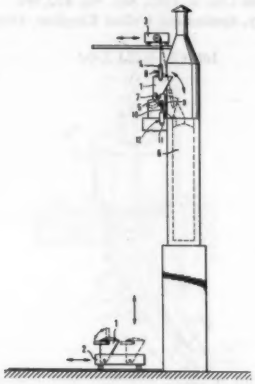
Matti J. Kuusikko, Ulvila, and Olavi K. Rantala, Pori, both of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Feb. 22, 1984, Ser. No. 581,217

Claims priority, application Finland, Aug. 21, 1979, 792605

Int. Cl.³ C21B *7/16*

U.S. Cl. 414—173 **4 Claims**



1. In a furnace installation comprising a furnace with a base and a charge inlet above the base, the combination therewith of apparatus for supplying material for charging said furance to said charge inlet, said apparatus comprising:

at least one skip for receiving said material, each said skip comprising a locking bar disposed with respect to the center of gravity of said skip so that when the skip is held by only said locking bar, the skip will tilt and discharge its contents;

a carriage movable between a material receiving position spaced from the base of said furnace and a position at the base of said furnace for carrying the skip between the material receiving position and the position at the base of the furnace;

lifting means for lifting each said skip from its position at the base of said furnace to adjacent said charge inlet, said lifting means comprising a handle engaging the skip and preventing tilting of the skip, as it is lifted, by an amount sufficient to discharge material therefrom, but permitting tilting of the skip, when the skip is held by the locking bar, without requiring movement of the handle with respect to the skip in the direction of lifting; and

locking means at said charge inlet for engaging said locking bar and holding the skip thereby, whereby the skip may be lifted by said handle from said carriage when it is at the base of the furnace and raised to adjacent the charge inlet with the locking bar in engagement with the locking means and thereafter, tilted to discharge said material into the charge inlet by removing the lifting force from said handle, said locking means comprising a movable member which is movable into a first position in which it is engageable with said locking bar and which is movable into a second position in which the member is out of the path of movement of said locking bar, and further comprising pneumatic means connected to said member for moving the latter between its first and second positions, said locking means comprising a surface which slopes downwardly away from the charge inlet and which is engageable with said locking bar, said member, in its first position, preventing movement of said locking bar along said surface.

4,501,527

DEVICE FOR AUTOMATICALLY TRANSPORTING DISK SHAPED OBJECTS

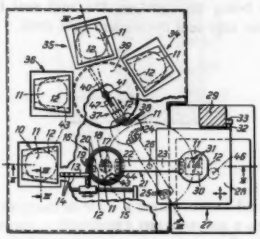
Hans-Dieter Jacoby, Werdorf, and Peter Schmidt, Huettenberg, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,706

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219502

Int. Cl.³ B65H 5/08

U.S. Cl. 414—225 **14 Claims**



1. In a system for operating on disk shaped objects comprising a discharge cassette, means for adjusting the height of said discharge cassette, a position adjusting station, an inspection table, depository cassettes, and means for adjusting the height of said depository cassettes, a device for automatically transporting said disk shaped objects from said discharge cassette through said position adjusting station to said inspection station and further into one of said depository cassettes, said device comprising:

a linearly displaceable transport arm disposed between said discharge cassette and said position adjusting station;

means on said linearly displaceable transport arm for eccentrically gripping one of said disk shaped objects;

a pivotal lever having a working range between said adjusting station and said inspection station;

means on said pivotal lever for eccentrically gripping one of said disk shaped objects;

a rotating plate;

a slide mounted on said rotating plate for radial movement into said working range of said pivotal lever; and

means on said slide for eccentrically gripping one of said disk shaped objects;

wherein said depository cassettes have openings positioned adjacent the periphery of said rotating plate for receiving disk shaped objects from said slide.

4,501,528

SYSTEM FOR AUTOMATIC STACKING, STORAGE AND WITHDRAWAL OF PACKAGED MERCHANDISE IN LARGE WAREHOUSES

Gunter Knapp, Hart-St. Peter, Fed. Rep. of Germany, assignor to Ing. Gunter Knapp Ges. mbH & Co. KG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 482,528, Apr. 6, 1983,. This application Apr. 2, 1984, Ser. No. 595,714

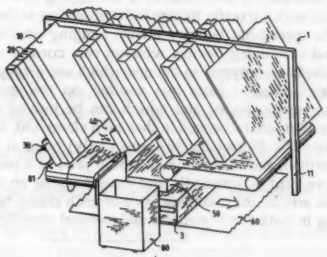
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3213119

Int. Cl.³ B65G 1/00

U.S. Cl. 414—273 **10 Claims**

1. System for carrying out a computer-controlled handling process for automatically stacking, storing and removing various types of packaged merchandise items from large warehouse installations, wherein the merchandise items are withdrawn in sequence from respective magazines associated with several shelves and loaded into passing transport containers, comprising the steps of: in a warehouse installation including a plurality of shelves which are subdivided into successively arranged blocks, the shelves of each block being associated with the respective product magazines, loading the various types of merchandise items into the product magazines while simultaneously removing the merchandise items from the shelves of a certain block by ejecting the merchandise items from the magazines associated with that certain block by remote-controlled ejection means when a transport container has arrived at a block preceding that certain block, collecting and then simultaneously loading the merchandise items into the transport container when the latter arrives at the certain block and causing the transport container to continue its movement immediately after having been loaded, and wherein the speed of the transport container is adjusted to substantially correspond to the sum of the ejection, collection and loading times so that removal of the merchandise items takes place in a minimal time,

said system including at least one computer, remote-controlled actuating elements, shelves, shelf floors associated with product magazines, transport containers for stacking and emptying the magazines and conveyor means, said shelves in said blocks each being subdivided into several shelf floors and said product magazines being attached to said shelf floors, said shelf floors being obliquely oriented and arranged with the normals to the planes in which said floors are situated substantially in the longitudinal direction of the shelf blocks, said product magazines having



ejector means mounted at their lower ends for transferring the merchandise items to said conveyor means, wherein the conveyor means collect the ejected merchandise items of a block in a release mechanism from which the merchandise items are loaded into the transport containers mounted on said conveyor means, wherein the operation of the system is controlled by a computer and that replacement merchandise items to be stacked are located in said transport containers for stacking, the containers in which replacement pieces are located being directed along different routes than those of the transport containers in which ejected items are located for withdrawal of the merchandise items, and

wherein said ejector means comprises

a bracket plate with a surface substantially normal to a longitudinal axis of a respective product magazine, with said product magazine disposed at a sufficient distance away from the respective bracket plate to allow a single item to be ejected in a downwardly diagonal direction between a lower end of said product magazine and said bracket plate,

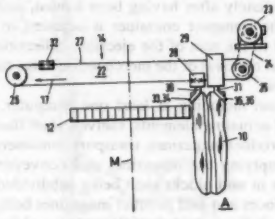
an engaging piece mounted to pass along said surface of said bracket plate to eject said single item and to return to a starting position by passing underneath said bracket plate, and

means for actuating movement of said engaging piece along said surface of said bracket plate.

4,501,529
APPARATUS FOR FEEDING LAUNDRY ARTICLES TO AN IRONING MACHINE

Wilhelm Wiebesiek, Vlotho, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,817
Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119880
Int. Cl.³ D06F 67/04
U.S. Cl. 414—751 8 Claims

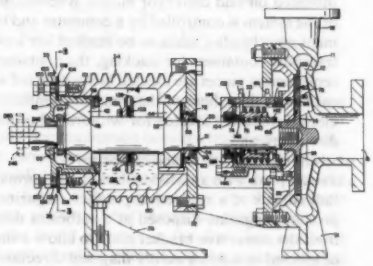


1. Apparatus for feeding laundry articles to a mangle or the like, with a horizontal spreading-out and conveying device for spreading out the laundry articles when hanging down vertically and freely and for feeding the laundry articles centrally to a belt-shaped feed conveyor conveying towards the mangle, and with a transfer device for transferring to the feed conveyor the spread-out laundry article hanging on the spreading-out and conveying device, wherein two corners of each laundry article are gripped in clamps which are arranged in pairs at a short distance from one another on the spreading-out and conveying device and which can be moved away from one another, characterised in that each clamp (30, 31) has clamping jaws (33, 34 and 35, 36 respectively) lying at an angle to the vertical, and in that the clamping jaws of a pair of clamps are divergent downwardly and extend across an upper corner of the article, the clamping jaws of each clamp being self-clamping in both the horizontal and vertical directions.

4,501,530
CENTRIFUGAL PUMP

Robert E. Rockwood, Windham, and Richard P. Antkowiak, Hampstead, both of N.H., assignors to A. W. Chesterton Company, Stoneham, Mass.

Continuation of Ser. No. 408,043, Aug. 13, 1982,. This application Aug. 3, 1984, Ser. No. 637,340
Int. Cl.³ F04D 5/00
U.S. Cl. 415—170 A 4 Claims



1. A centrifugal pump comprising a pump housing, a bladed impeller in said pump housing, a rotatable shaft extending into said pump housing and on which said impeller is mounted, said pump housing having a radially extending wall adjacent said impeller and through which said shaft extends, seal means on the other side of said wall from said impeller for sealing said wall through which said shaft extends, a seal housing for supporting said seal means and enclosing the portion of said shaft adjacent said pump housing on the other side of said wall from said impeller, said seal housing being demountably connected to said radially extending wall, said seal housing comprising

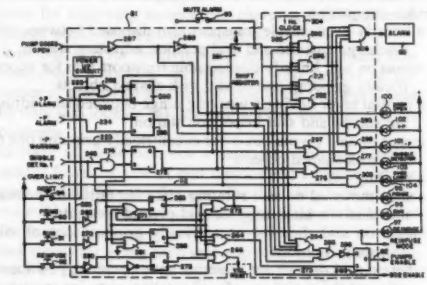
a removable wall portion on the other side of said wall from said impeller for permitting access to said sealing means and said portion of said shaft within said seal housing, without demounting said seal housing, and

a tube for carrying cooling fluid, said tube having entrance and exit ends passing through said removable wall of said seal housing and a portion of said tube intermediate said tube ends being arranged within said seal housing and coiled about said seal means and said shaft.

4,501,531
CONTROL CIRCUIT FOR A BLOOD FRACTIONATION APPARATUS

Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 330,898, Dec. 15, 1981, Pat. No. 4,447,191.
This application Dec. 5, 1983, Ser. No. 557,818
Int. Cl.³ F04B 49/00
U.S. Cl. 417—63 9 Claims



1. In a blood fractionation apparatus operable in conjunction with a disposable flow system for separating and collecting a blood fraction from whole blood, and including at least one motor-driven pump for conveying blood through the flow system, and a monitoring device providing an alarm output response to an abnormal condition in the system, a control circuit comprising, in combination:

a flip-flop responsive to a momentary alarm output from said monitoring device for producing a first alarm control signal;

a latch register responsive to the occurrence of said control signal for producing a second alarm control signal upon application of a latch signal;

aural alarm means;

visual alarm means;

alarm control circuit means responsive to said first alarm control signal for activating said aural and visual alarm means, and responsive to said second alarm control signal for inhibiting only said aural alarm means; and

user-actuated switch means for applying a latch control signal to said latch register to cancel said aural alarm without cancelling said visual alarm.

4,501,532

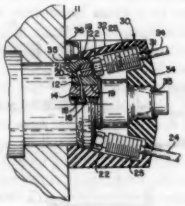
THERMAL SHOCK BARRIER FOR INJECTION PUMP

Collis E. Boyd, Glen Ellyn, Ill., assignor to International Harvester Co., Chicago, Ill.

Continuation of Ser. No. 457,996, Jan. 14, 1983, abandoned. This application Oct. 1, 1984, Ser. No. 657,038

Int. Cl.³ F04B *21/00, 17/02*

U.S. Cl. 417—313 4 Claims



1. In combination with a rotary diesel fuel injection pump having a rotor, a distributor head having a cylindrical periphery, a central bore receiving the rotor, and a plurality of output ports adapted to receive fuel from said rotor and supply it to a diesel engine through injection pipe means attached to said distributor head ports, a thermal shock barrier comprising an elastomeric member of low thermal conductivity disposed about and engaging said cylindrical periphery of said distributor head and preventing water from coming in contact with said peripheral portion, said thermal barrier having apertures through which said injection pipe means pass.

4,501,533

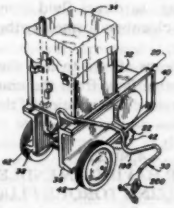
APPARATUS FOR DELIVERING LIQUID UNDER PRESSURE

Frank A. Bower, Jr., 3903 W. Dakin, Chicago, Ill. 60618

Filed Nov. 15, 1979, Ser. No. 94,486

Int. Cl.³ F04B *35/02;* B67D *5/06;* B65D *6/18;* F16K *51/00*

U.S. Cl. 417—388 28 Claims



1. An apparatus for delivering a liquid matieral under pressure comprising: a base; a source of mechanical energy mounted on said base; a diaphragm pump mounted on the said base and being drivingly connected to said source of mechanical energy, said diaphragm pump including, an annular reservoir tank for holding a pump liquid, said annular reservoir tank having a central open portion, a pump cylinder positioned in the central open portion of the annular reservoir tank, and a pump piston movably mounted in the pump cylinder for pumping the pump liquid; a circulatory system connected to the pump cylinder and to the reservoir tank for carrying circulating pump liquid between said cylinder and said tank; an air check valve connected to the circulatory system to allow air to be pulled into the circulatory system; a foldable container support mounted on the base; and a liquid material container removably mounted in the container support, said container being releasably connected to the diaphragm pump, said container including a valve seat mounted at the bottom of the container, a valve body removably engageable with the valve seat for control of flow of liquid material from the container, and a valve stem connected to the body and extending exteriorly of the container to operate the valve body.

4,501,534

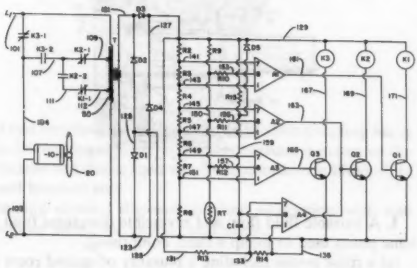
METHOD AND APPARATUS FOR PROLONGING SLEEVE BEARING LIFE IN A MULTIPLE SPEED ROTATIONAL DEVICE

Larry N. Hargis, N. Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,016

Int. Cl.³ F04B *21/00*

U.S. Cl. 417—572 6 Claims



1. A method of prolonging sleeve bearing life in a machine having a plurality of operating speeds and at least one lubricated sleeve bearing securing a rotating shaft which comprises the steps of:

selecting the appropriate rotational operating speed for the machine;

energizing the machine to operate at the appropriate rotational speed;

overriding the steps of selecting and energizing to operate the machine at a rotational velocity generally between 500 and 800 RPM for between two and four seconds to establish a lubricant film between the sleeve bearing and the rotating shaft; and

discontinuing the step of overriding after the elapse of at least the time period to establish the lubricant film, to permit the machine to operate at a rotational velocity less than that necessary to establish a lubricant film between the sleeve bearing and the rotating shaft.

3. A control arrangement for an electric motor having a lubricated sleeve bearing supporting the rotor shaft, said motor having a plurality of operating speeds, which comprises:

motor speed control means electrically connected to the motor wherein the motor is powering a fan for circulating air in heat exchange relationship with a refrigeration circuit;

sensor means for generating a response indicative of the motor speed desired wherein the sensor means comprises a thermistor mounted to the refrigeration circuit and connected to vary in resistance in response to a measured temperature;

circuit means connected to the sensor means and the motor speed control means for energizing the motor at the speed indicated by the sensor means wherein the circuit means comprises integrated circuits connected to detect voltage drops outside a predetermined range and to appropriately de-energize relays in response thereto; and

startup speed control means for energizing the motor at generally between 500 and 800 RPM, a predetermined minimum rotational speed for a time interval generally between two and four seconds to establish a lubricant film

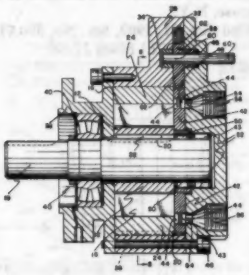
within the sleeve bearing prior to operating the motor at a reduced rotational speed less than generally 500 RPM.

4,501,535

VARIABLE FLOW REVERSIBLE VANE PUMP

Gary L. Golobay, 1215 Helen, Augusta, Kans. 67010

Filed Sep. 13, 1982, Ser. No. 417,680
Int. Cl.³ F04C *2/00, 15/02;* F04B *23/00*
U.S. Cl. 417—440 1 Claim



1. A variable fluid flow and reversible directions fluid flow vane pump used to pump a fluid, comprising;

(a) a rotor means including a plurality of spaced rotor slots circumscribing the periphery of said rotor means;

(b) a vane means radially slidably mounted within each said rotor slots and radially variably extending beyond said periphery of said rotor means when biased by a force;

(c) a power take off means connected to said rotor means to rotate same;

(d) a cam ring means having an inside surface of an elongated curved shape;

(e) said rotor means rotatably mounted within said cam ring means and said vane means engaging said inside surface of said cam ring menas.

(f) a rotary valve plate means mounted against said cam ring means and said rotor;

(g) said rotary valve plate means including (1) a pair of arcuate grooves; (2) at least one port in each of said grooves; and (3) valve movement means;

(h) a case means encasing said cam ring means;

(i) a front bearing plate means connected to said case means to enclose one end thereof;

(j) a rear bearing plate means connected to said case means to enclose another end thereof;

(k) said rear bearing plate having apertures in fluid flow communication with respective ones of said grooves and said ports of said rotary valve plate means;

(l) a control means operably connected to said valve movement means to selectively rotate said rotary valve plate means relative to said cam ring means and said rotor means;

(m) said rotary valve plate means selectively rotatable to

(1) a first position to direct all of the fluid in said arcuate grooves within said arcuate grooves with no fluid directed to or received from said apertures;

(2) a second position to direct a variable fluid flow output through one of said apertures; and

(3) a third position to direct a variable fluid flow output through the other one of said apertures being a reversed fluid flow relative to said second position;

(n) said rotary valve plate means having four of said grooves on opposite sides thereof; and

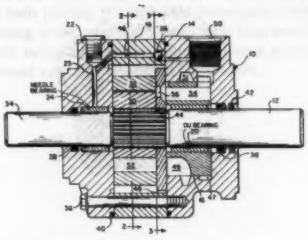
(o) pairs of said grooves directly opposed to each other and each of said pairs of said grooves connected to a respective one of said apertures.

4,501,536

COMPACT HIGH TORQUE GEROTOR-TYPE HYDRAULIC MOTOR

Carle A. Middlekauff, Cumberland, Me., assignor to W. H. Nichols Company, Lexington, Mass.

Filed Mar. 8, 1983, Ser. No. 473,367
Int. Cl.³ F01C *1/113, 21/02, 21/04;* F03C *2/08*
U.S. Cl. 418—61 B 12 Claims



1. An apparatus comprising:

a. a housing having an inlet and an outlet port for the entry and exit of fluid;

b. a shaft rotatable about a fixed axis having an output end extending from said housing;

c. bearings for supporting said shaft, one of said bearings located adjacent to said shaft's output end being a sleeve bearing adapted to be pressurized during operation of said motor;

d. an inner member mounted upon said shaft for central rotation about the longitudinal fixed axis of said shaft, said inner member being disposed between said bearings;

e. an outer member mounted within said housing for eccentric nonrotational oribital movement with respect to said fixed axis, said outer member defining with said inner member a plurality of circumferentially spaced chambers, the volume of individual chambers varying with rotation of the inner member;

f. commutator means positioned coaxially and co-planar to said sleeve bearing, to direct fluid from said inlet and outlet ports to the chambers formed by the inner and outer members; and

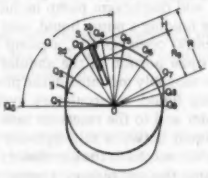
g. rotatable valve means affixed to said shaft and rotatable therewith the control flow from the commutator to the chambers and thereby cause rotation of the inner member.

4,501,537

VANE COMPRESSOR HAVING AN ENDLESS CAMMING SURFACE MINIMIZING TORQUE FLUCTUATIONS

Yutaka Ishizuka, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,233
Claims priority, application Japan, Oct. 23, 1981, 56-169586
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—150 28 Claims



1. In a vane compressor including: a pump housing having inner surfaces thereof formed with an endless camming inner

peripheral surface; a cylindrical rotor rotatably received within said pump housing, said rotor having an outer peripheral surface thereof formed therein with a plurality of axial slits; a plurality of vanes radially movably fitted in said slits of said rotor; and a drive shaft coupled to said rotor for causing rotation of said rotor in unison therewith; whereby rotation of said rotor causes said vanes to slidingly move along said endless camming inner peripheral surface of said pump housing n a predetermined circumferential direction to define at least one pumping chamber between the inner surfaces of said pump housing, the outer peripheral surface of said rotor and said vanes, for performing suction, compression and discharge of fluid, the improvement wherein said endless camming inner peripheral surface of said pump housing has at least one portion for performing one cycle comprising a suction stroke, a compression stroke and a discharge stroke of fluid in cooperation with said vanes and said rotor, which consists essentially of: an increasing radius portion having a cam profile such that each of said vanes has an amount of protrusion from said rotor gradually increasing with movement thereof along said increasing radius portion, said increasing radius portion consisting of a first portion having a cam profile such that said each vane has a protruding velocity thereof gradually increasing as it moves along said first portion, and a second portion having a cam profile such that said each vane has a protruding velocity thereof gradually decreasing as it moves along said second portion; a first decreasing radius portion having a cam profile such that said each vane has an amount of protrusion thereof from said rotor gradually decreasing and a receding velocity thereof gradually increasing, as it moves along said first decreasing radius portion; a second decreasing radius portion having a cam profile such that said each vane has an amount of protrusion from said rotor gradually decreasing and a receding velocity thereof gradually decreasing, as it moves along said second decreasing radius portion; a third decreasing radius portion having a cam profile such that said each vane has an amount of protrusion from said rotor gradually decreasing and a receding velocity thereof gradually increasing as it moves along said third decreasing radius portion; and a fourth decreasing radius portion having a cam profile such that said each vane has an amount of protrusion from said rotor gradually decreasing and a receding velocity thereof gradually decreasing as it moves along said fourth decreasing radius portion; said first and second portions of said increasing radius portion and said first, second, third and fourth decreasing radius portions each having a starting end and a terminating end, and being successively arranged in the order mentioned in said predetermined moving direction of said vanes, said first and second portions of said increasing radius portions having their combined circumferential angle set at a value smaller than 90°, said first and second decreasing radius portions being at least in part located in a rotational angle region of said rotor where fluid pressure acting upon a portion of said each vane protruded from said rotor rapidly increases with movement of said each vane along the same region, whereby fluctuations in torque acting upon said rotor are restrained in said rotational angle region of said rotor.

4,501,538

COTTON CANDY ACCESSORY FOR BLENDER

Carl R. Bray, 503 S. Green St., and Lee Cueni, 500 E. 3rd, Apt. 5, both of Lees Summit, Mo. 64063

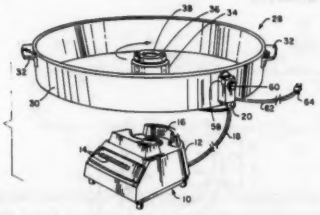
Filed Jun. 17, 1982, Ser. No. 389,443
Int. Cl.³ B28B *17/00*
U.S. Cl. 425—9 **4 Claims**

1. An attachment for use with a household blender, said blender being characterized by a motor, a motor drive shaft and a drive coupling on the end of said shaft, said attachment comprising:

an open top container having an opening in the center of the container bottom;

rotatable hopper means mounted in the center of said container and adapted to receive the ingredients, including sugar, for making cotton candy, said hopper means being characterized by a plurality of orifices for distributing said ingredients around said container under influence of centrifugal forces;

drive means coupled with said hopper means having a shaft projecting through said opening in the bottom of said container, said shaft having an end coupling which is complemental to the drive coupling on the end of said motor drive shaft,



said end coupling and said motor drive shaft coupling being in driving engagement when the container is seated on the blender and disengaged when said container is lifted off of said blender; and

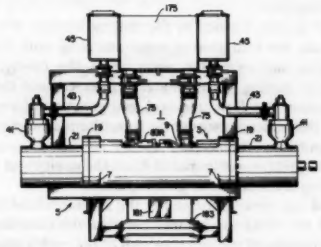
a heating element disposed in close association with said hopper means for melting said sugar.

4,501,539

APPARATUS FOR REMOVING THE LIQUID PHASE FROM A SLURRY OF FINE GRANULAR MATERIAL

Edward A. Fenton, Jr., Pittsburgh; Ira W. Lakin, Volant; Joseph H. Stein, Coraopolis; John R. Lohr, Pittsburgh, and David A. Schreiber, Bethel Park, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1983, Ser. No. 557,466
Int. Cl.³ B30B *9/02;* **B29C** *3/00;* **B28B** *1/26*
U.S. Cl. 425—84 **28 Claims**

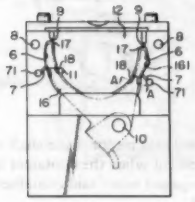


1. A platen for use in a press in which the liquid phase is removed from a slurry of fine granular material by compressing the slurry against the platen, said platen comprising a planar member defining arcuate slots forming a pattern of segmented concentric annular openings through which the liquid phase is expressed.

4,501,540
INSERT MOLDING DEVICE

Hiroyoshi Kako, Aichi; Nobuo Kobayashi, and Toshiaki Kaneyuki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 19, 1982, Ser. No. 443,159
Claims priority, application Japan, Dec. 24, 1981, 56-191774[U]
Int. Cl.³ B29C 6/04
U.S. Cl. 425—116 6 Claims



6. An insert molding device for covering a portion of a workpiece with a plastic material, the device including an upper mold and a lower mold having surfaces that mate together to form a cavity for receiving, with a small clearance to accommodate variations within manufacturing tolerances, an inserted workpiece of preselected size and shape, a portion of the cavity being enlarged to provide a molding chamber of increased clearance surrounding a predetermined region of an inserted workpiece, an injection gate having an outlet opening into the molding chamber for delivering molten plastic material under pressure to said chamber for molding a plastic covering on said predetermined region of an inserted workpiece, and a clamping pin having an end extending through the wall of the cavity outside of but adjacent to the molding chamber, said end conforming to the surface of an inserted workpiece for pressing the workpiece against the opposite wall of the cavity for eliminating any extrusion of a thin flash of excess plastic material from the molding chamber in the region where the clamping pin contacts the workpiece and where the workpiece contacts the opposite wall of the cavity, wherein the improvement comprises:

a lead groove formed in the mating surface of one of the molds, the lead groove communicating with the molding cavity and extending away from the cavity, whereby excess molten plastic material injected into the molding chamber can flow into said lead groove to form a casting fin that extends outwardly from the plastic covering and from the workpiece;

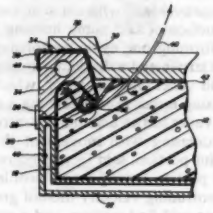
an enlarged reservoir spaced from the cavity and communicating with said lead groove; and

at least one groove formed in the surface of the cavity outside the molding chamber between the clamping pin and the portion of the opposite wall of the cavity adapted to be contacted by an inserted workpiece, the groove communicating with the molding chamber, such that excess plastic material injected into the molding cavity will flow into said at least one groove in preference to said small clearance to form a thick extension, defined by said groove, of said plastic covering molded on the predetermined surface portion of an inserted workpiece instead of a thin flash in the region of the small clearance.

4,501,541
MOLD ASSEMBLY FOR MOLDING CUSHION ARTICLES

George L. Bethell, Rock Island, Ill.; Donald F. Burch, Coralville, and Lysle R. Hinkhouse, Wilton, both of Iowa, assignors to Sears Manufacturing Co., Davenport, Iowa

Continuation-in-part of Ser. No. 418,395, Sep. 15, 1982,. This application Jul. 7, 1983, Ser. No. 511,497
Int. Cl.³ B29D 27/04
U.S. Cl. 425—117 11 Claims



1. A mold assembly for molding a cushion article with an integral support member, comprising:

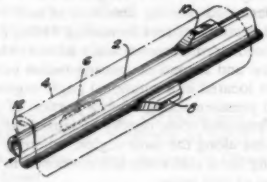
a mold having the shape of the desired cushion article and being adapted to position a support member in said mold, the support member having means for venting air entrapped within the mold, the support member intended to be an integral part of the molded cushion article; and

conduit means establishing communication between said support member and vent means and the exterior of said mold for evacuating the entrapped air during a molding operation.

4,501,542
INTERNAL TUBE SUPPORT FOR CO-EXTRUSION STUFFING TUBE ASSEMBLY

Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1983, Ser. No. 567,245
Int. Cl.³ B29F 3/04; A22C 7/00, 11/00
U.S. Cl. 425—133.1 18 Claims

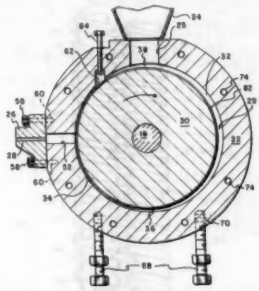


1. In an apparatus for co-extruding an elongated food product having a central core formed of one food product and a second food product circumscribing said core, said apparatus including a first supply source to feed one food product to a first extrusion tube, and a second supply source to feed said second food product to a second extrusion tube coaxially mounted around the first tube; the improvement comprising at least two ramped spacing means spaced from each other radially or both radially and longitudinally on a surface of said extrusion tubes, and being positioned in an annulus formed by said extrusion tubes, each of said spacing means being in contact with only one of said first and second extrusion tubes, one of said tubes having a mounting such as to allow centering of the inner tube within the outer tube while allowing for a controlled eccentric movement of the inner tube within the outer tube in order to minimize clogging of said second food product at said spacing means.

4,501,543
ROTARY EXTRUDER

Raleigh N. Rutledge, and Granville J. Hahn, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jan. 13, 1983, Ser. No. 457,614
Int. Cl.[3] B29F 3/012
U.S. Cl. 425—191 12 Claims



1. Apparatus for plasticizing thermoplastic material and the like, comprising:

a housing having an inner recess, an inlet, and a die aperture communicating with said recess;

an extrusion member rotatably mounted in said recess in said housing, said extrusion member comprising a cylindrical rotor eccentrically disposed within said recess to define a first clearance zone and an opposing second smaller clearance zone, both said clearance zones extending along the axial length of said rotor between the inner surface of said housing and the outer surface of said rotor, said rotor including a plurality of directing grooves on the inside surface at each end thereof, said directing grooves angularly positioned with respect to the direction of said rotation of said rotor to propel thermoplastic material therein circumferentially about the inner surface of said housing and axially toward the center of said housing;

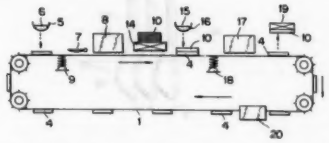
ring members positioned within said recess at opposite ends thereof, each said ring member including a plurality of helical channelling grooves on the inside surface thereof, said channelling grooves encircling said extrusion member and directed axially toward the center of said housing to spirally channel thermoplastic material propelled by said directing grooves towards the center of said housing, a central collecting groove encircling the inside surface of said ring in communication with channeling grooves to collect thermoplastic material spirally propelled from said channelling grooves, and at least one outlet groove on the inside surface of said ring members in communication with said central collecting groove and with said first clearance zone to channel thermoplastic material spirally propelled from said central collecting groove into said first clearance zone; and,

means for axially rotating said rotor to plasticize the thermoplastic material within said clearance zones and to deliver the plasticized material from said clear zones through said die aperture.

4,501,544
APPARATUS FOR CONTINUOUSLY AND AUTOMATICALLY MOLDING CHOCOLATE BLOCK HAVING ORNAMENTAL RELIEF PATTERN

Tokuji Akutagawa, Tokyo, Japan, assignor to Akutagawa Confectionery Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,179
Claims priority, application Japan, May 31, 1983, 58-94909
Int. Cl.[3] B29D 31/00; B29C 1/00; A23G 7/00, 1/26
U.S. Cl. 425—218 12 Claims



1. An apparatus for continuously and automatically molding a chocolate block including an ornamental relief pattern made of a first chocolate material of one color and a body portion carrying said ornamental relief pattern and made of a second chocolate material of different color, comprising:

(a) conveyer means for carrying thereon a plurality of first molds successively placed at intervals, each first mold having a top face provided with at least one engraved mold cavity;

(b) means for casting a fluidized first chocolate material for forming said ornamental relief pattern into each of the engraved mold cavities of said first molds one by one;

(c) a scraper for scraping the top face of each first mold to press said first chocolate material into said engraved mold cavity and to scrape off the excess first chocolate material;

(d) a first cooler for cooling said first chocolate material contained in said engraved mold cavity of said first mold;

(e) means for placing a second mold in situ on each of said first molds, said second mold having at least one through-opening defining said body portion and being free from permanent connection with said first mold;

(f) means for casting a fluidized second chocolate material into said second mold combined with said first mold through said through-opening;

(g) a second cooler for successively cooling said first and second chocolate materials contained in the combined first and second molds to solidify the same;

(h) means for removing the solidifed first and second chocolate materials from the molds to obtain an integral product chocolate block; and

(i) cleaner means for cleaning said first molds to remove the chocolate materials adhering thereon, said cleaner means being disposed between said means (b) and said means (h).

4,501,545
MANUFACTURE OF INFLATABLE ARTICLES

Ralph A. Divoky, Maple Heights, Ohio, assignor to California Ceramic Supply Co., Cleveland, Ohio

Division of Ser. No. 294,288, Aug. 19, 1981, abandoned, which is a continuation of Ser. No. 99,542, Dec. 3, 1979, abandoned. This application Mar. 1, 1983, Ser. No. 471,050
Int. Cl.[3] B29H 3/04
U.S. Cl. 425—275 13 Claims

1. A balloon-making form, comprising:

(a) an elongate, cylindrical stem configured at one end for attachment to a carrier;

(b) a generally spoon-shaped end portion formed at the end of the stem removed from the configured end portion, the spoon-shaped end portion including:

(i) a convex surface;

(ii) a concave surface;

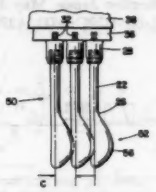
(iii) smoothly contoured transition surfaces connecting the concave and convex surfaces;

(iv) a rounded tip; and

(v) a smoothly contoured portion connecting the spoon-shaped end portion to the stem;

(c) a longitudinal axis extending centrally of the stem;

(d) the transition surfaces and at least one edge of the stem lying in a first plane spaced from the longitudinal axis; and



(e) a second plane, parallel to the first plane, being coincident with the longitudinal axis and defining a line of intersection with the convex surface, the smoothly contoured portion, and the stem, the second plane dividing the form into two sections having equal surface areas.

4,501,546

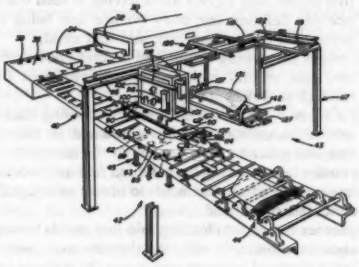
VACUUM MOLD FOR MAKING A WINDSHIELD SUBASSEMBLY

James L. Valimont, Cheswick, and Hershel L. Phares, Apollo, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 287,607, Jul. 28, 1981, Pat. No. 4,366,013. This application Sep. 20, 1982, Ser. No. 420,148

Int. Cl.³ B29C *1/00, 3/00*

U.S. Cl. 425—388 **9 Claims**



1. A mold for supporting a flexible sheet of interlayer material for assembly against a bent glass sheet of concave elevational configuration comprising a first wall having a curved configuration conforming to the elevational configuration of said bent glass sheet, a second wall of similar curved configuration having an aperture adapted for coupling to a vacuum source, a plurality of spacer elements of uniform thickness distributed throughout the extent of said walls and separating said walls, a substantially vacuum tight peripheral spacer wall of rigid, curved, frame-like configuration enclosing the space between said walls of curved configuration, said first wall having a plurality of apertures distributed throughout its extent, whereby when said aperture in said second wall is coupled to said vacuum source, said flexible sheet of interlayer material is held against said first wall and assumes its curved configuration, and when said aperture is disconnected from said vacuum source, said flexible sheet of interlayer material is free to separate from said first wall.

4,501,547

APPARATUS FOR SHAPING COILED SLIDE FASTENER COUPLING ELEMENTS

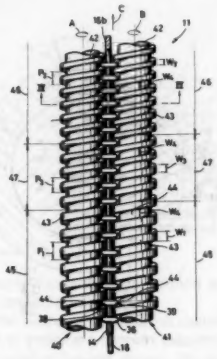
Hisayoshi Mizuhara, Kurobe; Shigenori Omori, Uozu, and Akira Tanaka, Kurobe, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,492

Claims priority, application Japan, Apr. 13, 1982, 57-61358

Int. Cl.³ B28B *11/08*

U.S. Cl. 425—391 **12 Claims**



1. An apparatus for shaping a row of helically coiled continuous coupling elements defining therein a longitudinal space receiving therein a continuous core thread, each coupling element having a pair of spaced legs, said apparatus comprising:

(a) a mandrel for having wound thereon the coiled coupling elements and having a longitudinal groove for the passage therethrough of the core thread; and

(b) a pair of parallel externally threaded cylindrical screw members disposed on opposite sides of said mandrel in lateral alignment with the same and drivably corotatable in a common direction to feed the coupling elements and the core thread on said mandrel longitudinally from one end to the opposite end of said screw members, each said screw member having a cylindrical shank and a continuous helical thread on said shank defining a helical groove between turns thereof for receiving therein one leg of each pair of spaced legs of the coupling elements, each said screw member including at said one end a first portion having a first pitch larger than a predetermined pitch of the coupling elements as ultimately shaped, at said opposite end a second portion having a second pitch substantially equal to said predetermined pitch, and a third portion between said first and second portions, gradually reducing in pitch in a direction from said one end toward said opposite end.

4,501,548

LABEL TRANSFERRING DEVICE FOR BLOW MOLDING MACHINES

Werner F. F. Jahnel, Haslett, Mich., assignor to Bekum Plastics Machinery Inc., Williamston, Mich.

Filed Jul. 18, 1983, Ser. No. 514,869

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—503 **19 Claims**

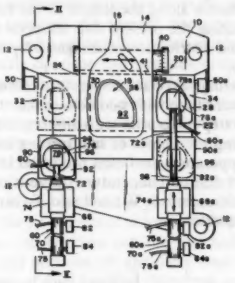
1. A label transferring device for container blow molding machines having separable mold sections which define a mold cavity mounted on a pair of spaced, movable platens, said device comprising:

a mold insert having at least a first and a second label carrying segments, each of said segments being slidable into said cavity to a molding position whereat it closes said

cavity and forms a portion of the interior surface of said cavity and slidable out of said cavity to a label loading position whereat a label may be loaded thereon;

means on each of said segments for receiving and retaining a label and exposing the same to the interior of said cavity when said segment is in the molding postion;

a label supply and first means for transferring a label to said first segment from said label supply when said first segment is at said loading position, and second means for



transferring a label to said second segment from said label supply when said second segment is at said loading position, said second transferring means being separate from said first transferring means; and

means for alternately shifting said segments between said molding position and said loading position, whereby one of said segments is positioned in said cavity while the other of said segments is simultaneously positioned at said label loading position and said transfer means transfers a label thereto.

4,501,549

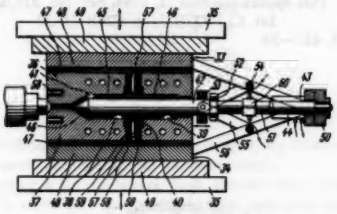
INJECTION MOLD WITH REPLACABLE INSERT IN MOLD CAVITY OUTLET OPENING

Vsevolod V. Abramov, Poklonnaya ulitsa, 6, kv. 4; Vsevolod V. Kuznetsov, Komsomolsky prospekt, 38/16, kv. 92; Alexandr V. Veselov, ulitsa K. Marxa, 21/4, kv. 20; Vitaly S. Tkhai, ulitsa Veshnyakovskaya, 25/2, kv. 227, all of Moscow; Nikolai I. Rysin, Moskovskaya oblast, ulitsa Kirova, 22, korpus 1, kv. 27, gorod Solntsevo, and Vasily I. Gerasimov, Derbenevskayanaberezhnaya, 1/2, kv. 81, Moscow, all of U.S.S.R.

Division of Ser. No. 370,739, Oct. 2, 1981, Pat. No. 4,439,390. This application Mar. 26, 1984, Ser. No. 593,630

Int. Cl.³ B29F *1/022*; B29C *1/00*

U.S. Cl. 425—542 **4 Claims**



1. A split mold of an injection-molding machine, comprising two half-molds mounted on plates of the injection-molding machine; coolant supply channels formed in said half-molds; a first die incorporated in one of the half-molds and having forming surfaces; a second die incorporated in the other half-mold and having forming surfaces; a gating system for feeding the polymer melt; cavities defined by the forming surfaces when the half-molds are brought together, said cavities communicating with each other and with the gating system; openings of said cavities, adapted to communicate the cavities with each other and with the gating system, the openings disposed at the entrance of the melt into the cavity serving as inlets and those disposed at the exit of the melt from the cavity as outlets; conventional heaters mounted in said first and second die at the inlet and outlet openings; replaceable inserts positioned at the outlet openings of the cavity to alter the flow area of these openings.

4,501,550

CAP MEANS FOR PREVENTING RESIN FROM REMAINING IN A MOLD OF A RUNNERLESS INJECTION MOLDING APPARATUS

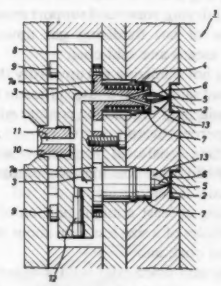
Hiroharu Nikkuni, Yonezawa, Japan, assignor to Shigeru Tsutsumi, Yonezawa, Japan

Filed Nov. 30, 1982, Ser. No. 445,841

Claims priority, application Japan, Dec. 2, 1981, 56-192736

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—549 **4 Claims**



1. In a runnerless injection molding apparatus having a pointed heating tip member for heating a gate, permanently open passage surrounded by a mold wall for supplying a fused resin into a cavity through said gate along the surface of said pointed heating tip member, and a heating cylinder having heater means to be heated externally of the passage, the improvement comprising:

cap means for preventing resin from collecting and remaining in a space formed adjacent to a front end of said heating cylinder, said cap means being of a frusto-conical profile incorporated in said space and being provided in its center with an opening to maintain said permanently open passage and through which an end of said pointed heating tip member can pass in an axial direction of said cap means, and

a remainder space formed adjacent to a front end of said cap means for collecting a small portion of resin to provide a thermally insulating interface between said mold wall and fused resin passing along the surface of said heating tip, said cap means thermally insulating said remainder space from the front end of said heating cylinder,

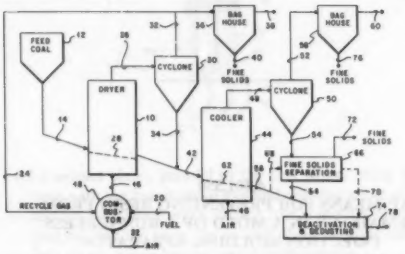
whereby resin supplied into said cavity is maintained in proper molding condition and scorching and thermal decomposition of resin collected in said remainder space is prevented.

4,501,551

METHOD FOR PRODUCING A DRIED PARTICULATE COAL FUEL FROM A PARTICULATE LOW RANK COAL

Louis P. Riess, Evergreen, and Bernard F. Bonnecaze, Littleton, both of Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 10, 1983, Ser. No. 550,424
Int. Cl.³ F27B *15/00*; F26B *3/08*
U.S. Cl. 432—15 **11 Claims**



1. A method for producing a dried particulate coal fuel having a reduced tendency to spontaneously ignite from a particulate low rank coal, said method consisting essentially of:

(a) charging said coal to a coal drying zone;

(b) supporting a bed of said coal above a support means in said coal drying zone, said support means being adapted to the flow of hot fluidizing gas upwardly through said support means and said coal;

(c) flowing hot fluidizing gas upwardly through said support means and said coal at a rate sufficient to fluidize said coal to dry said coal to a water content of less than about 14 weight percent water;

(d) recovering dried coal from said coal drying zone;

(e) cooling said dried coal to a temperature below about 100° F. in a coal cooling zone;

(f) separating at least a major portion of the finely divided coal particles of a size less than about 80 Tyler Mesh from said dried coal; and

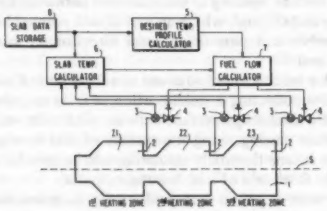
(g) treating said dried coal with a deactivating fluid to reduce the tendency of said dried coal to spontaneously ignite.

4,501,552

METHOD FOR CONTROLLING FURNACE TEMPERATURE

Yoshinori Wakamiya, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,439
Claims priority, application Japan, Sep. 8, 1982, 57-157727
Int. Cl.³ B21B *37/10*
U.S. Cl. 432—49 **2 Claims**



1. A method of controlling furnace temperature for use with a slab heating furnace having a zone with controllable heating means, including the steps of:

(a) calculating a desired temperature profile of a slab as it progresses through a furnace divided into sub-zones along its length, said calculation minimizing total fuel flow and based on shape information of said slab, slab temperature at a prior position within said furnace, and the predetermined slab temperature at a discharge position of the furnace;

(b) predicting the distribution of the gas temperature at each said subzone along the length of the furnace;

(c) calculating the present slab temperature distribution by using said distribution of said gas temperature predicted in step (b);

(d) comparing said slab temperature calculated in step (c) at the present time with said desired slab temperature calculated in step (a) to produce a difference between them; and

(e) adjusting the output of said heating means according to said temperature deviation produced in step (d);

wherein said desired temperature curve is predicted based on the T_{si} which minimizes W_T and said T_{si} is calculated according to the equation

$$W_T = \frac{1}{(H_g - T_{gi} \cdot C_{pg} \cdot C)} \left[\sum_{i=1}^{n} \{A_i \cdot [(T_{si} + 273)^4 + E_i(T_{si+1} - T_{si-1})]^{\frac{1}{4}} - 273 + B_i\} + \sum_{i=1} \frac{C_p \cdot \gamma \cdot H \cdot v}{2 \cdot l_i} (T_{si+1} - T_{si}) \right]$$

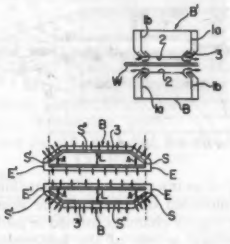
where W_T is the total injected fuel flow, H_g is the heat produced per unit of fuel flow, T_{si} is the slab temperature in the ith subzone, T_{gi} is the temperature at the center of the ith subzone, C_{pg} is the specific heat of the exhausted gas, C is a constant relating the volume of exhausted gas to the fuel flow, A_i and B_i are constants depending on the structure of the furnace, T_{si} is the slab temperature in the ith subzone, C_p is the specific heat of the slab, E_i is equal to $(C_p \cdot \gamma \cdot H \cdot v)/(D_i \cdot l_i \cdot 2)$ where γ is the specific gravity of the slab; H is the thickness of the slab, D_i is the radiative heat conversion coefficient, l_i is the length of the ith subzone, and v is the velocity of the moving slab.

4,501,553

FLOATING EQUIPMENT AND FLOATING-TYPE HEAT TREATING FURNACE FOR STRIPLIKE WORKS

Masayuki Imose, Kawanishi; Takao Seno, Mino, and Yoshihito Sakaguchi, Kyoto, all of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Division of Ser. No. 391,704, Jun. 24, 1983, Pat. No. 4,455,136. This application Mar. 2, 1984, Ser. No. 570,032
Int. Cl.³ F27B *9/28*; F26B *13/20*
U.S. Cl. 432—59 **4 Claims**



1. A pressure pad for directing jet or streams of fluid against an adjacent, continuous strip of material adapted to travel

along a flow path which is generally parallel to a first axis of the pad, the pressure pad comprising:

a first line of jet nozzles including first jet nozzle opposite end portions with one of the opposite end portions disposed at each end of a first jet nozzle central portion, at least one of the first jet nozzle end portions being disposed at an angle relative to the pad first axis and diverging outwardly thereof from the first central portion toward the one first jet nozzle outer terminal end such that the outer terminal end is spaced further from the pad first axis than an inner terminal and thereof disposed at the first central portion; and a second line of jet nozzles including second jet nozzle opposite end portions with one of the opposite end portions disposed at each end of a second jet nozzle central portion, at least one of the second jet nozzle end portions being disposed at an angle relative to the pad first axis and diverging outwardly thereof such that an outer terminal end of the one second jet nozzle end portions is spaced further from the pad first axis than an inner terminal end thereof disposed at the second central portion; wherein the jet nozzles of at least the first and second jet nozzle one end portions and the first and second jet nozzle other end portions are angularly disposed in such manner that jets of fluid emitting therefrom and striking a material strip passing adjacent thereto exert an outward force on the strip along the pad first axis which tends to stretch the strip.

4,501,554

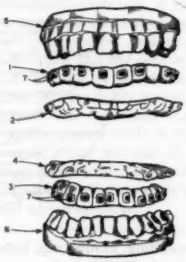
TWO TRAY INDIRECT BONDING SYSTEM FOR LABIAL AND LINGUAL BRACKETS

John H. Hickham, 325 23rd St., Kenner, La. 70062

Filed Jul. 25, 1983, Ser. No. 516,906

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—24 **5 Claims**



1. An orthodontic method for use in applying brackets to a patient's teeth, comprising the following steps:

(a) molding a first, relatively soft, flexible tray of the patient's teeth and incorporating into said first tray the brackets properly positioned to be applied to the teeth; and

(b) molding a second, complementary configured but relatively hard and rigid second tray of the patient's teeth for placement over the exterior of said first tray, providing in supplemental fashion rigidity to the back of said first tray; producing a two tray system which in face-to-face combination has an inner teeth contacting flexibility from said first tray and an outer rigidity from said second tray.

4,501,555

PERIODONTAL PROBES

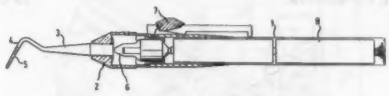
Frederick Ditchburn, Weybridge, England, assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Feb. 2, 1984, Ser. No. 576,287

Claims priority, application United Kingdom, Mar. 21, 1983, 8307716

Int. Cl.³ A61C *1/00, 3/00*

U.S. Cl. 433—29 **3 Claims**



1. A self-contained periodontal probe and light source comprising, in combination, an elongated handle body containing a source of light, a light-transmitting probe shaft supported by one end of said handle body and terminating in a tapered light-transmitting measuring tine extending laterally from said shaft and provided with a series of spaced transverse devices thereon, said light source being adapted to illuminate said light probe and devices thereon to permit ready visual observation of said devices on said tine as rings of light when said probe is in use.

4,501,556

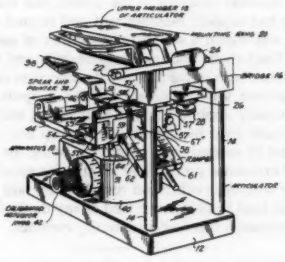
APPARATUS AND METHOD FOR FABRICATION OF DENTAL PROSTHESES

Joseph Zelnigher, 310 W. 47th St., New York, N.Y. 10036

Filed Mar. 23, 1983, Ser. No. 477,924

Int. Cl.³ A61C *11/00*

U.S. Cl. 433—56 **14 Claims**



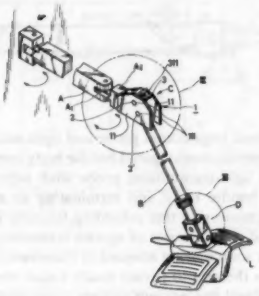
1. A device for use in the construction of dental prostheses embodying impression trays and poured casts, comprising:

a base adapted to be placed on an articulator, a tabletop on said base, the height of which is adapted to be adjustable; a removable template adapted to be pivotably mounted to a cradle provided on said tabletop; a knife edge unit having spaced apart knife edges, and a spear box and pointer adapted to be raised or lowered, a ramp, including a track having a sliding plate for carrying and for guiding the movement of said spear and box pointer, carried on said knife edge unit and a cooperatively associated adjustment screw for raising and lowering said spear box and pointer; said knife edge unit being removably attached to said base; and said spear box being guided for movement along said ramp by threaded means in an inclined sloped direction.

4,501,557
BALANCING DEVICE FOR DENTAL ARM

Jun Tamura; Takahiro Matsui, both of Kyoto, and Kazuo Hozumi, Shiga, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 25, 1983, Ser. No. 516,802
Claims priority, application Japan, Jul. 26, 1982, 57-113638[U]
Int. Cl.³ A61C 1/14
U.S. Cl. 433—79 13 Claims



1. A balancing device for a vertically movable dental arm assembly, which includes first and second arms and a head load, either of said arms being vertically movable, characterized in that said balancing device comprises:

a frame body which includes a pair of parallel vertical support plates and is connected to the end of said first arm;

upper and lower fixed shafts which are horizontal and parallel with each other at different levels and are inserted into holes in said support plates;

a sliding rod support member which is coaxially connected to the connection end of said second arm and has a crosswise groove and a lengthwise groove whose longitudinal axes intersect into which said fixed shafts are slidably inserted respectively;

a spring member inserted in the connection section of said sliding rod support member and said second arm; and

a sliding rod which is supported by either of said upper and lower fixed shafts and inserted coaxially and slidably into said second arm in the lengthwise direction of the lengthwise groove within said sliding rod support member to continuously apply a force to said spring member;

whereby said load head moves freely up and down when said first or second arms is moved, while the movements of said crosswise groove and lengthwise groove are interrelated with each other and restricted by said fixed shafts, and said load head is positioned at any desired position by the restoration force of said spring member.

4,501,558
ULTRASONIC DENTAL CLEANING TIP STABILIZER

Joachim H. Maliga, 4014 8th Ave., Brooklyn, N.Y. 11232

Filed Mar. 15, 1984, Ser. No. 589,674
Int. Cl.³ A61C 1/07
U.S. Cl. 433—86 4 Claims

1. A stabilizer improvement for use with an ultrasonic dental device of the type having a water nozzle and a scaling tip positioned adjacent to one another and having a shield around the tip, the shield having a longitudinal groove within which the water tube extends, the stabilizer improvement comprising:

a wafer-like body portion having a major first opening adapted to receive the shield and a minor second opening adapted to receive the shield and a minor second opening adapted to receive the water nozzle,

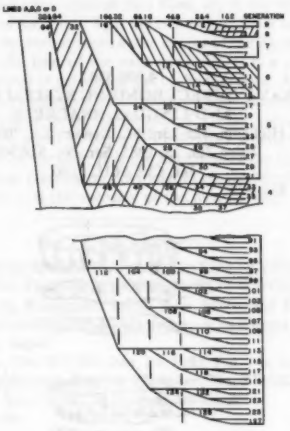
said body portion including a tab extending into said first opening, said tab being dimensioned and positioned to extend into the groove of the shield when said stabilizer is mounted on the shield,

whereby, when said stabilizer is mounted with said shield extending through said first opening, said water tube extending through said second opening and said tab extending into the groove of said shield, the water tube is positioned at a predetermined location to avoid contact with both the edges of the shield and the scaling tip as well as to be positioned adjacent to and directly over the scaling tip.

4,501,559
BASIC COMPREHENSIVE GENEALOGICAL AND FAMILY HISTORY SYSTEM OF STRAIGHTLINE GENEALOGY

Beth H. Griswold; Gail E. Griswold, and Alexandra F. Griswold, all of 767 Acacia Ave., Melbourne Village, Fla. 32901

Filed Apr. 2, 1982, Ser. No. 364,683
Int. Cl.³ G09B 29/00
U.S. Cl. 434—154 8 Claims



1. A process of recording, numbering, indexing storing and rapid retrieval of genealogical records to produce a rich and lasting family history resource using minimum numbers of pieces of paper, with indefinite extension into the past and into the future without re-structuring, re-numbering, or re-copying, and which provides equal and adequate space for recording the information for each generation, including the provision for multi-parent and adoptive families as well as for the ancestors of these and for ancestors of spouses of future generations by providing:

A. a Basic Surname Chart (BSC) for recording a span of successive generations of a male surname line in equal-sized columns across the top of the chart, each one of which is for recording the male of that generation of that line, his birth and death dates and places, and the names of his spouse and her mother and father;

B. Individual Family Charts (IFC) to record each union in the span for which data is known and successive generations of the wives' surname lines in equal-sized columns across the top of the chart corresponding to those on the BSC, and providing space for information about the individual family units resulting from the above-mentioned union; and

C. Personal Information Charts (PIC) used to record precise personal information about individual family members.

4,501,560

INBOARD OUTBOARD DRIVE

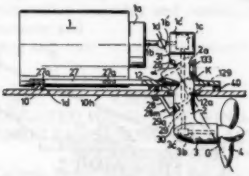
Lennart Brandt, Fjäras, and Heinz Pichl, Upsala, both of Sweden, assignors to AB Volvo Penta, Goteborg, Sweden

Filed Jan. 28, 1983, Ser. No. 461,877

Claims priority, application Sweden, Feb. 3, 1982, 8200600; Feb. 3, 1982, 8200601; Feb. 3, 1982, 8200602

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—53 **28 Claims**



1. An inboard outboard drive for use in a boat having an inboard located engine part and an opening in the bottom shell of the boat hull comprising a propeller leg assembly having an upper inboard housing portion and a lower outboard housing portion and extending essentially vertically through the opening, upper angular gear means mounted in said upper housing portion, output shaft means of said engine part having an inboard mounted universal joint and extending essentially horizontally for drive connecting the engine part to said upper angular gear means, lower angular gear means mounted in said lower outboard housing portion, propelling means mounted on said lower outboard housing portion for propelling the boat, power transmission means including a power transmission shaft extending essentially vertically in said propeller leg assembly for drive connecting said upper angular gear means to said lower angular gear means, and propeller shaft means extending from said lower angular gear means and projecting horizontally out of one end of said lower outboard housing portion and carrying said propeller means, and bearing means mounted inboard the hull over said opening for pivotally mounting said propeller leg assembly in the opening for steering pivotal movement about the axis of said bearing means defining side steering axis which is inclined at an acute angle to said power transmission shaft, forwardly at its upper end and passes through said universal joint.

4,501,561

BRACE DEVICE FOR MOTOR BOAT DRIVE UNIT

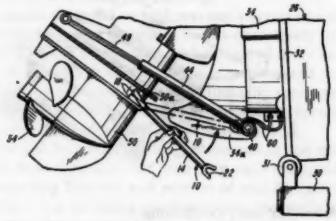
Paul G. Speelman, 319 Old St. Rd., Clarksville, Ohio 45133

Filed Jul. 14, 1983, Ser. No. 513,717

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—61 **4 Claims**

1. In an inboard/outboard motor boat power assembly including a power drive shaft housing adapted to be mounted on the transom of a boat, a propeller drive unit supported by the housing for pivotal movement between an operative lower position and an inoperative elevated position, a pair of parallel spaced fluid actuated cylinders pivotally connected to the propeller drive unit, a horizontal support shaft extending through a lower portion of the drive shaft housing and pivotally supporting the fluid cylinders, the cylinders being effective to tilt the propeller drive unit between the lower and elevated positions, an improved brace device for supporting the drive unit in the elevated position, comprising an elongate rod, an elongate U-shaped engagement member secured to one end of the rod and disposed perpendicular to the rod, a V-shaped engagement member secured to the opposite end of the rod, the elongate U-shaped member being positioned within



the drive shaft housing and releasably seated on the support shaft between the fluid cylinders, and the V-shaped member being releasably engageable with the propeller drive unit when the brace device is positioned between the propeller drive unit and the support shaft to secure the propeller drive unit in the elevated position.

4,501,562

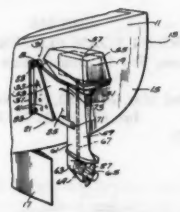
MARINE PROPULSION DEVICE FOR SAILBOATS

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 211,530, Dec. 1, 1980, abandoned. This application Aug. 29, 1983, Ser. No. 527,012

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—61 **5 Claims**



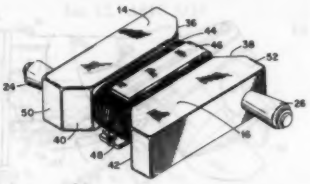
1. A marine propulsion device comprising a transom bracket adapted to be mounted on the transom of a boat, a propulsion unit assembly including a rotatably mounted propelling element, and means connected to said propulsion unit assembly and said transom bracket for selectively rectilinearly displacing said propulsion unit assembly relative to said transom bracket between a running position and a second elevated position spaced from the running position and against other material movement of said propulsion unit assembly relative to said transom bracket, said means for selectively rectilinearly displacing said propulsion unit assembly comprising a link which is extensible and contractable and which is connected between said transom bracket and said propulsion unit assembly, and means engaged between said propulsion unit assembly and said link for non-releasably preventing pivotal movement in a vertical plane of said propulsion unit assembly with respect to said link.

4,501,563

MARKER BUOY

Robert W. Johnson, 25 Muirfield Dr., Arden, N.C. 28704, and Richard S. Hobbs, R.D. #5, Box 394, Seneca, S.C. 29678

Filed Mar. 17, 1983, Ser. No. 476,191
Int. Cl.³ B63B *21/52*
U.S. Cl. 441—6 **6 Claims**



1. A marker buoy comprising:

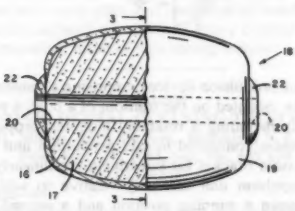
a body made from a material enabling said body to float on the surface of a liquid; said body having first and second side members, and central portion therebetween; the length of said central portion being shorter than the length of either of said side members; said central portion being generally of a solid rectangular shape; each of said side members being in the shape of an elongated pontoon for stabilizing said marker buoy; the length of each of said side members being greater than its width; each of said members having first and second surfaces which taper inwardly toward said central portion; a first stud extending from said first side member and a second stud extending from said second side member; said first stud being near one end of said body and said second stud being near the opposite end of said body; said central portion receiving an elongated twine having a weight attached to its far end; said body automatically rotating to dispense said twine when said body is placed on the surface of a liquid; said body adapted to be manually rotated by manipulation of said studs to retrieve said twine; said first and second tapered surfaces of each of said side members adapted to guide said twine onto said central portion.

4,501,564

LUMINESCENT FOAM FLOATS AND METHOD

David C. Cairone, Sr., 18 Buckingham Rd., Seymour, Conn. 06483

Filed Mar. 29, 1982, Ser. No. 362,915
Int. Cl.³ B63B *21/52*
U.S. Cl. 441—20 **18 Claims**



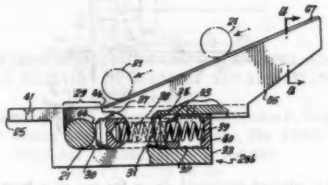
1. Luminescent marine seine float comprising a heat expanded microporous molded body of foamed synthetic thermoplastic resinous composition having an exposed outer surface portion which is susceptible to erosion, wearing away, chipping and scratching of some of the foam composition therefrom and having an integral transverse axial passage capable of receiving a rope therethrough characterized by the exposed outer surface area of said float comprising at least one surface portion of said foamed synthetic thermoplastic resinous composition containing an effective amount of a luminescent pigment uniformly dispersed throughout at least a substantial thickness thereof to cause said surface portion to emit light during several hours of darkness, the erosion, wearing away, chipping or scratching of the exposed areas of the surface portion merely exposing underlying areas of the surface portion which also contain said luminescent pigment so that the light-emitting properties of said surface portion are not reduced, at least one adjacent surface portion of said float comprising a surface portion which does not contain luminescent pigment.

4,501,565

CENTRIFUGE BUCKET HANGER WITH LOADING RAMP

Alireza Piramoon, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 31, 1983, Ser. No. 499,563
Int. Cl.³ B04B *5/02*
U.S. Cl. 494—85 **10 Claims**



1. A self-loading hanger for supporting one side of a swinging bucket in a centrifuge rotor, said hanger adapted for mounting, one on either side, of a space in said rotor for containing said bucket, said bucket having a pivot axis defined by a pair of pivot pins disposed one on each side thereof, said hanger having an opening for receiving one of said pivot pins, said hanger having spring means enabling translation of said pivot axis in said hanger when centrifugal force acting on said bucket overcomes the resistance of said spring means, comprising:

ramp means disposed on the upper side of said hanger for guiding a pivot pin of said bucket into said opening of said hanger, thereby enabling said pivot pins to be self-seating in said hanger by the influence of gravity when said bucket is deposited in said rotor.

4,501,566

METHOD FOR ASSEMBLING A HIGH VACUUM ROTATING ANODE X-RAY TUBE

Roland W. Carlson, Lyndhurst, and Edward A. Blaskis, Hudson, both of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Sep. 19, 1983, Ser. No. 533,704
Int. Cl.³ H01J *9/00*
U.S. Cl. 445—28 **7 Claims**

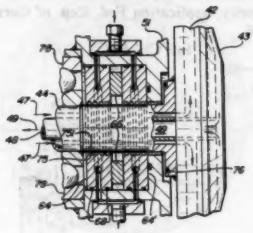
1. A method of assembling a rotating anode x-ray tube of the type having an anode mounted for rotation about an axis thereof, the anode having a rotor and a shaft extending therefrom, a temporary static seal disposed on said rotor, a housing enclosing portions of said rotor and defining therewithin an evacuable region of high vacuum, a magnetic seal assembly disposed about the shaft of said anode for fluidically vacuum sealing said region while permitting rotation of said shaft, and bearing means disposed about said shaft outside of said region for transmitting rotary motion of said shaft through said fluidic vacuum seal, the steps comprising:

(a) compressing said temporary seal so as to immobilize said rotor and seal said region;

(b) lowering the pressure within said region to a sufficiently

low level that permits maintenance therein of a stable high vacuum requiring only a small mobile vacuum pump;

(c) installing the magnetic seal assembly about said shaft while maintaining said high vacuum;



(d) installing the bearing means about said shaft adjacent said magnetic sealing assembly and outside of said region of high vacuum; and

(e) releasing said rotor to permit rotation of said anode.

4,501,567

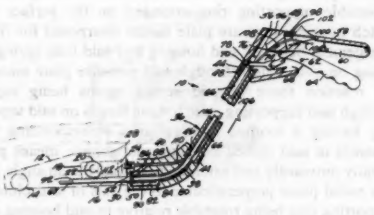
ELONGATED WAND-TYPE WIND-UP AND TRIGGER-RELEASED SEPARABLE ACTUATOR FOR MOTORIZED TOY

Philip W. Cathell, 9340 Cardiff Loop Rd., Richmond, Va. 23235

Filed May 3, 1983, Ser. No. 491,299

Int. Cl.³ A63H *29/00*

U.S. Cl. 446—430 **8 Claims**



7. In combination:

a toy of the kind which includes a body having a mechanically wound-up motor for mechanically powering the toy, including a wind-up means constructed and arranged to be rotated in one direction for storing mechanical energy in the motor, and a releasable catch for preventing the motor from beginning to wind-down until the catch is triggered for release; and

an elongated wand-type wind-up and trigger-released separable actuator, comprising:

an elongated housing having a forward end portion and a rear end portion which are substantially separated by an intermediate elongated portion;

an elongated rack pull rod longitudinally slidably mounted to said elongated housing and having a forward end portion projecting forwardly from said forward end portion of said elongated housing;

lever means mounted on said rear end portion of said elongated housing and including means operatively connecting with said lever means with said elongated rack pull rod, so that as the lever means is manipulated the elongated rack pull rod is longitudinally reciprocated in a sense to partially retract the projecting forward end portion of said elongated rack pull rod into said elongated housing;

return means for returning said lever means and elongated rack pull rod following such manipulation;

said projecting forward end portion of said elongated rack pull rod having a series of rack teeth provided thereon which constitute a rack constructed and arranged to operatively, meshingly engage with said wind-up means of said mechanically wound-up motor of said toy;

an elongated drive activator rod longitudinally slidably mounted to said elongated housing and having a forward end portion projecting forwardly from said forward end portion of said elongated housing;

button means mounted on said rear end portion of said elongated housing and including means operatively connecting said button means with said elongated drive activator rod, so that as the button means is manipulated the elongated drive activator rod is longitudinally reciprocated in a sense to longitudinally move the projecting forward end portion of said elongated drive activator rod;

return means for returning said button means and said elongated drive activator rod following such manipulation;

said projecting forward end portion of said elongated drive activator rod including catch releasing end surface means provided thereon and being constructed and arranged to engage and releasingly trigger said releasable catch; and

means on said forward end portion of said elongated housing for releasably locking said elongated wand-type actuator to said toy body.

4,501,568

SHUTTLE WHEEL TOY

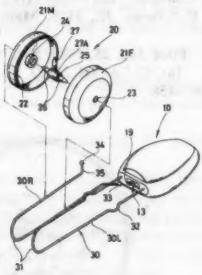
Muneo Nagaoka, Tokyo, Japan, assignor to I & K Trading Company, Washington, D.C.

Filed Sep. 2, 1983, Ser. No. 528,800

Claims priority, application Japan, Jul. 28, 1983, 58-136700

Int. Cl.³ A63H *33/02*

U.S. Cl. 446—450 **5 Claims**



1. A shuttle wheel amusement device comprising:

a pair of metal shuttle wheel support rails, said rails being substantially parallel and of equal length, and each of said rails having a basal end and a distal end;

a shuttle wheel disposed between and magnetically secured to said pair of metal shuttle wheel support rails, said shuttle wheel having

a light permeable synthetic casing with substantially circular side walls projecting on either side of an imaginary surface extending from one of said support rails to the other of said support rails at corresponding points on said support rails, each of said side walls having an opening located in substantially the center of said side walls,

a rotary shaft of sufficient length to contact and be magnetically supported by both of said shuttle wheel support rails, said rotary shaft being operable to move along said support rails when said support rails are tilted with respect to said rotary shaft, and said rotary shaft extending through each of said openings in said side walls, and

a light emission element comprising a pair of light emis-

sion diodes of different colors positioned within said synthetic casing and anchored to said rotary shaft to turn about said rotary shaft and move with said shaft along said support rails; and

a gripping means operable to be held and oscillated by hand motion, said gripping means comprising

a pair of support rail openings operable to receive each of said basal ends of said shuttle wheel support rails, and

a power supply and control assembly having

a pair of metal terminals, each of said terminals contacted to an end of one of said shuttle wheel support rails,

an on/off power switch,

a pair of power cells positioned within said gripping means and operable to selectively impart a positive charge to one of said support rails and a negative charge to the other of said support rails, and

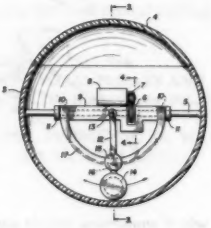
a polarity changeover switch having a first position and a second position such that when said power switch is in an on position and said polarity changeover switch is in said first position only one of said light emission diodes is illuminated, and when said polarity changeover switch is in said second position only the other of said light emission diodes is illuminated.

4,501,569

SPHERICAL VEHICLE CONTROL SYSTEM

Leonard R. Clark, Jr., 128 Weldy Ave., Oreland, Pa. 19075, and Howard P. Greene, Jr., 31 S. Main St., Schwenksville, Pa. 19473

Filed Jan. 25, 1983, Ser. No. 460,930
Int. Cl.³ A63H *29/22, 30/04, 17/36*
U.S. Cl. 446—458 **9 Claims**



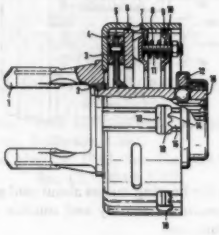
1. A spherical vehicle control system comprising, a spherical shell adapted to roll on a supporting surface, an axle extending diametrically across the interior of said shell, the ends of said axle being rigidly connected to the inner surface of said shell, frame means mounted on said axle, motor drive means mounted on said frame means and operatively connected to said axle for rotating said axle and associated spherical shell to thereby cause said shell to roll on a supporting surface, said frame means being journaled on said axle whereby said frame means remains in a vertical plane during rotation of said shell, mass means, means suspending said mass means from said frame means so that it is movable in a plane containing said axle, and control means operatively connected to said mass means for changing the position of said mass means by moving it toward one end of said axle or toward the other end thereof during the rolling motion of said shell, to thereby shift the center of gravity of said shell, whereby continuous steering of the vehicle is accomplished during the rolling thereof.

4,501,570

ADJUSTABLE FRICTION CLUTCH

Mathias Konrad, Troisdorf, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmer, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,743
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151486
Int. Cl.³ F16D *7/02*
U.S. Cl. 464—48 **5 Claims**



1. An adjustable friction clutch particularly for protecting a drive line for an agricultural implement driven from the power takeoff shaft of a tractor comprising: a clutch hub adapted to be connected to said power takeoff shaft; at least one driving plate connected in rotative driving engagement with said clutch hub; a dished housing in operative torque transmitting engagement with said clutch hub having a surface provided with channels uniformly distributed on the circumference thereof pointing radially inwardly and extending axially; an adjustable supporting ring arranged on the surface of said clutch housing; pressure plate means interposed for frictional engagement between said housing and said hub; spring means acting on said clutch through said pressure plate means with the reaction force of said spring means being supported through said supporting ring; tongue means on said supporting ring having a toothed configuration corresponding to said channels in said dished housing, said tongue means pointing radially outwardly and extending obliquely at an angle relative to a radial plane perpendicular to the axis of said clutch; said supporting ring being rotatable relative to said housing so as to adjust the tension of said spring means thereby to effect adjustment of the torque transmission characteristics of said clutch; and stop means on the surface of said dished housing in the region of said channels arranged at the same distance from the edge of said housing for limiting the range of movement of said adjustable supporting ring.

4,501,571

LARGE OPERATING ANGLE CONSTANT-SPEED JOINT

Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Mar. 9, 1983, Ser. No. 473,435
Claims priority, application France, Mar. 15, 1982, 82 04323
Int. Cl.³ F16D *3/16, 3/26*
U.S. Cl. 464—111 **12 Claims**

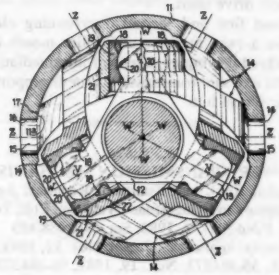
1. A constant-speed joint for interconnecting two shafts and comprising:

two elements, each said element being rigid and coaxial with a respective one of said shafts;

a plurality of yokes interconnecting said two elements;

means for mounting each said yoke on one of said elements to pivot about an axis perpendicular to the axis of said one element; and

means for mounting each said yoke on the other of said element and comprising a double pivotal mounting and a



slidable connection allowing a sliding motion along an axis perpendicular to the axis of said other element.

4,501,572

PROTECTIVE COVER ASSEMBLY FOR A GREASE FITTING

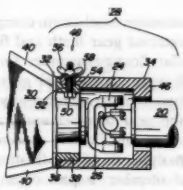
Wolfgang Hook, Viernheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 23, 1982, Ser. No. 391,321

Claims priority, application European Pat. Off., Aug. 26, 1981, 81303906.2

Int. Cl.³ F16D *3/84*

U.S. Cl. 464—170 **3 Claims**



1. A protective cover assembly for a grease fitting formed on a universal joint, said universal joint being part of a Cardan shaft which is capable of transmitting torque between a transmission and a gear case, said protective cover assembly comprising:

(a) a cover plate projecting outward from said gear case and encircling a portion of said Cardan shaft;

(b) a support member including a flange having a stepped outer surface with a radially aligned aperture formed in a smaller diameter surface and having three equally spaced apart legs which extend outward from said flange toward said gear case, said legs straddling said cover plate and being attached to said gear case such that when said support member is attached to said gear case, said smaller diameter surface encircles a portion of said Cardan shaft and is located adjacent to said universal joint;

(c) a one-piece tubular sleeve having a first end slidably positioned onto said smaller diameter surface of said support member in a direction axially of said Cardan shaft to completely cover said universal joint, and having a second end with a smaller diameter aperture formed therein through which said Cardan shaft passes, said sleeve further having an L-shaped slot extending inward from said first end whereby the base leg of said L-shaped slot is aligned with said aperture formed in said support member when said sleeve is fully positioned on said flange; and

(d) a single attachment device extending upward through said aperture formed in said support member and through said L-shaped slot formed in said sleeve for releasably securing said sleeve to said support member whereby said grease fitting is protected from contamination when said sleeve is secured to said support member and whereby access is provided to said grease fitting when said sleeve is released and slid back away from said support member irrespective of the radial direction along which said grease fitting happens to lie.

4,501,573

PROTECTION DEVICE FOR A UNIVERSAL JOINT

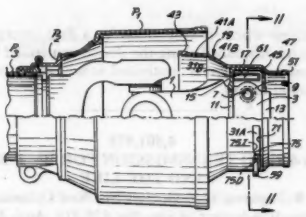
Edi Bondioli, Via Gina Bianchi 18, Suzzara, Italy

Filed Jul. 6, 1982, Ser. No. 395,719

Claims priority, application Italy, Jul. 14, 1981, 9474 A/81

Int. Cl.³ F16D *3/84*

U.S. Cl. 464—172 **4 Claims**



1. In a protection device for a universal joint, comprising a bifurcated part, said bifurcated part having two axially spaced annular seatings,

a splined coupling sleeve portion,

retaining means co-operating with said sleeve portion to retain said sleeve portion on an associated shaft,

a first ring part,

a second ring part,

said ring parts, when assembled together, being mounted on said seatings of said bifurcated part to form assembled ring parts,

protection sleeve means mounted on the assembled ring parts,

means serving to maintain the protection sleeve on said assembled ring parts, said means serving to maintain the protection sleeve on said assembled ring parts comprising means defining a slot in said protection sleeve and a resilient snap-action tongue formed in said assembled ring parts and capable of penetrating the slot,

said slot in the protection sleeve being of arcuate form and allowing the tongue of the ring to make relative angular movements between extreme positions, wherein said assembled sleeve and ring parts each define a peripheral surface of revolution which mate with each other, the two surfaces having respective apertures which are aligned in one relative location of the tongue in the slot and are offset in another relative location of the tongue in the slot.

4,501,574

TRANSMISSION RATIO VARIATORS

Pedro Ybern Miro, C/Guipûzcoa, 159-4°, Barcelona - 20, Spain

Filed Aug. 24, 1983, Ser. No. 526,130

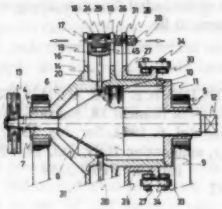
Claims priority, application Spain, Jul. 19, 1983, 524.266

Int. Cl.³ F16H *9/02*

U.S. Cl. 474—49 **4 Claims**

1. Improvements in transmission ratio variators wherein there is established the transmission between a drive shaft and a driven shaft between two orbital systems comprising gear wheels which move concentrically to their respective shafts and where the radii of each orbit are simultaneously variable, the gear wheels being mounted on shafts which are radially displaced in notches made in peripheric wings of sleeves joined to the control elements of the orbits, characterised in that each

of the shafts of the gear wheels has a truncated thickening contained in a housing provided in each gear wheel, and said shafts are axially displaced being blocked in and unblocked from the wheels depending on the direction of the displacement thereof which is controlled by a disc emerging from a ring which is displaced along the sleeve controlled by a double fork whose movement is controlled at will and is produced by conventional means.



4,501,575

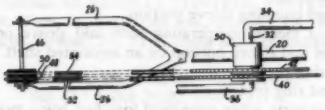
MULTI-SPEED TRANSMISSION FOR BMX BICYCLES AND THE LIKE

Fernand S. Lapeyre, 1224 Octavia St., New Orleans, La. 70115

Continuation-in-part of Ser. No. 525,319, Aug. 22, 1983, abandoned. This application Feb. 6, 1984, Ser. No. 577,138

Int. Cl.³ F16H *9/00*

U.S. Cl. 474—74 **13 Claims**



1. A multispeed transmission system for BMX bicycles and the like having a frame, a pedal drive shaft and a rear wheel having a transverse hub, comprising

a high and a low speed pedal drive sprocket fixedly mounted in parallel closely spaced adjacent relation on the pedal drive shaft on one side of said frame,

an exposed portion of said hub extending transversely from said rear wheel on said one side of said frame providing a transmission system support surface,

a high and a low speed wheel drive sprocket mounted in parallel closely spaced adjacent relation on said transmission system support surface portion of said rear wheel hub.

a first drive chain connecting said high speed pedal and wheel sprockets,

a second drive chain connecting said low speed pedal and wheel sprockets,

a first overrunning roller element clutch disposed intermediate said high speed wheel drive sprocket and said transmission system support surface portion of said rear wheel hub,

a second overrunning roller element clutch disposed intermediate said low speed wheel drive sprocket and said transmission system support surface portion of said rear wheel hub,

said high speed wheel drive sprocket being normally biased in response to rotation of said pedal drive shaft into controlling driving relation with said rear wheel hub through said transmission system support surface to drive said rear wheel and in overriding relation with said low speed wheel drive sprocket, and

means responsive tomanual manipulation by a rider of said bicycle for selectively and temporarily disengaging said high speed wheel drive sprocket from driving relation with said rear wheel hub to permit said low speed wheel drive sprocket to drive said rear wheel without effective interruption of drive in response to continued rotation of said pedal drive shaft,

wherein said first and second overrunning clutches each comprise a cage member and roller means displaceable into wedged driving engagement intermediate said wheel sprockets and said transmission system support surface on said rear wheel hub.

4,501,576

POWER TRANSMISSION MECHANISM

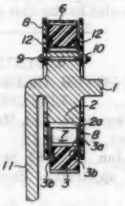
Mitsuo Tanaka, Kuki, and Kunitoshi Kozakae, Ageo, both of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,499

Claims priority, application Japan, Nov. 12, 1981, 56-180320; Nov. 19, 1981, 56-184372; Nov. 19, 1981, 56-184373

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—141 **4 Claims**



1. A power transmission mechanism comprising a gear member formed with external gear teeth and fixedly secured to a first axle, an annular floating member formed with internal gear teeth meshed with the external gear teeth of the gear member, a transmission wheel member spaced from the floating member and the gear member and fixedly secured to a second axle, an endless and flexible transmission member engaging the outer peripheries of the floating member and the transmission wheel member, a pair of annular guide plates connected to the outer sides of one of the group of the floating member and the gear member for rotation therewith and for preventing disengagement of the floating member laterally from the gear member, the guide plates each having an inner periphery whose diameter is determined such that at any angular position of the floating member with respect to the gear member the entire inner periphery extends inwards beyond the root circle of the gear member while being spaced from the first axle, and a pair of seal rings arranged between the opposite inner sides of the guide plates and both outer sides of the other of the floating member and the gear member for preventing entry of foreign material into a space formed between the gear member and the floating member.

4,501,577

SPROCKET WHEEL

Franz Roling, and Gunther D. Schoop, both of Lunen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Apr. 21, 1982, Ser. No. 370,632

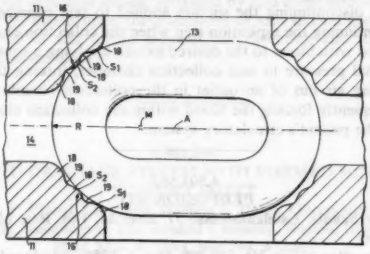
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115927

Int. Cl.³ F16H *55/30, 7/00*; B65G *25/06*

U.S. Cl. 474—155 **11 Claims**

1. A sprocket wheel having a plurality of equi-spaced circumferential teeth, each pair of adjacent teeth defining therebetween a pocket, the pockets being shaped to engage links of a drive chain, said teeth having flanks constituting chain link bearing faces, each of the pockets being formed partially by the

flanks of a pair of adjacent teeth defining that pocket, the improvement wherein each of the flanks has at least three distinct bearing surfaces which define multiple contact points between the chain links engaged the flanks of said pair of



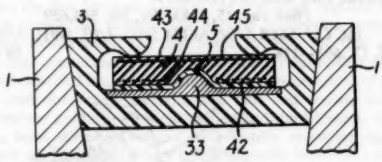
adjacent teeth, such that said at least three distinct bearing surfaces ensure multiple point contact between said chain links and each flank irrespective of minor size variation in said chain links, thereby eliminating high loading peaks and preventing dangerous notching and heavy wear of the chain links.

4,501,578

RIDERS FOR TRAPEZOIDAL DRIVE BELT

Andre Schneider, Wallisellen, Switzerland, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Nov. 4, 1983, Ser. No. 549,541
Claims priority, application France, Nov. 18, 1982, 82 19480
Int. Cl.³ F16G *1/00*
U.S. Cl. 474—201 **13 Claims**



1. A drive belt, the cross-section of which has a substantially trapezoidal outer contour, formed essentially of at least one flexible possibly hysteretic core having a body and inner and outer faces, which is closed on itself and is substantially nonextendible in the longitudinal direction of the belt, optionally having a longitudinal and/or transverse reinforcement, and of an assembly of independent riders which are substantially noncompressible in the longitudinal direction of the belt and are mounted on the core, characterized by the fact that

at least one of the inner or outer faces of the core, seen in cross-section, has at least one continuous cutout in the longitudinal direction of the belt; and

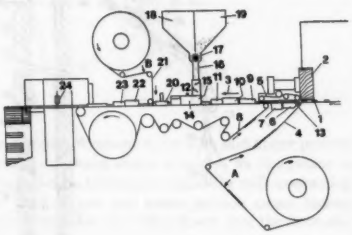
at least one portion of the riders has a protuberance of corresponding shape housed permanently within the cutout so that the cutout and protuberance cooperate to assure transverse guidance of the riders on the core.

4,501,579

CIGARETTE FILTER UNITS

Serge Boegli, Zürich, and Jean-Pierre Lebet, Montreux, both of Switzerland, assignors to F. J. Burrus & Cie., Boncourt and Baumgartner Papier S.A., Crissier, both of, Switzerland

Division of Ser. No. 892,086, Mar. 31, 1978, Pat. No. 4,281,591, and a continuation of Ser. No. 197,505, Oct. 16, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 552,005
Claims priority, application Switzerland, Apr. 4, 1977, 4178/77
Int. Cl.³ A24C *5/50*
U.S. Cl. 493—45 **2 Claims**



1. A cigarette chamber filter unit produced in an apparatus from a plurality of filter elements with the aid of a porous and continuously supplied covering strip transported in a moving direction, so as to produce a continuous filter strand having a plurality of chamber openings, and with the aid of a filling device and a closing strip, by means of steps comprising:

applying an adhesive substance in the form of spots or short lines to said covering strip along a plurality of approximately equispaced coating tracks,

orienting said coating tracks so that each coating track forms a predetermined angle with said moving direction, and so that said adhesive substance will be applied on at least three locations separated from one another, along a line at right angles to the moving direction of said covering strip, the lateral spacing between said coating tracks being at least three times as large as the width of the coating tracks of said adhesive substance,

at least partially wrapping said covering strip around said filter strand,

introducing granular filter material into said openings to form filter chambers,

applying an adhesive substance in the form of spots or short lines to said closing strip along a plurality of approximately equispaced closing strip coating tracks,

orienting said closing strip coating tracks so that each closing strip coating track forms a predetermined angle with said moving direction,

adhesively covering said chamber openings with said closing strip, and

thereafter subdividing said filter strand into a multiplicity of units, each of said units constituting said cigarette chamber filter unit.

4,501,580

INDWELLING CATHETERS

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

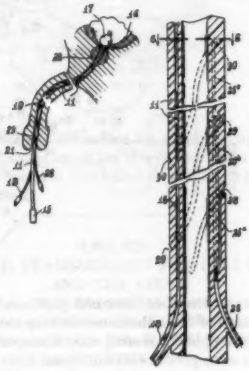
Continuation of Ser. No. 215,568, Dec. 12, 1980,. This application Jan. 21, 1983, Ser. No. 459,837
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—43 **3 Claims**

1. A catheter for use in the irrigation of a bladder and flushing of urethral and prostatic canal, comprising;

a. a flexible tubular member having an annular wall of uniform diameter;

b. said wall having exterior and interior surfaces;

c. said tubular member having a closed end for insertion into the bladder and an open outer end;
d. an annular inflation balloon adjacent the insertable end of said tubular member;
e. the interior surface of said tubular member forming an axial flow duct of uniform diameter having at least one drain hole near said closed end to receive fluid drainage from the bladder;
f. a passage in the wall of said tubular member extending from said tubular outer end and opening at it's other end into the interior of said balloon;



g. a relative deep channel in said exterior surface of said tubular member extending from adjacent the open outer end of said member into close proximity with the balloon;
h. a fluid passageway in the annular wall of said member: and
i. at least one radial vent in said tubular member flow-connecting said fluid passageway with said channel whereby fluid delivered through the vent enters the channel for distribution on the walls of the prostatic and urethral canals to eliminate ascending infection in said channel.

4,501,581

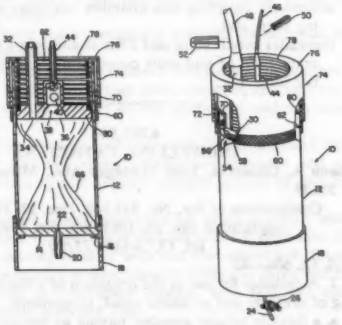
METHOD FOR AUTOTRANSFUSION OF BLOOD

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Division of Ser. No. 290,666, Aug. 5, 1981, Pat. No. 4,424,053. This application Sep. 23, 1983, Ser. No. 535,033

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—52 **3 Claims**



1. A method of autotransfusing a patient comprising the steps of connecting a single collection chamber with a source of suction, aspirating blood from a pool of blood within the patient by an aspirating tube connected to the collection chamber, depositing the aspirated blood in said collection chamber while applying suction to the chamber to withdraw air therefrom, discontinuing the suction applied to said chamber and discontinuing the aspiration step when the collection chamber is filled with blood to the desired extent, applying a squeezing external pressure to said collection chamber, forcing the remaining air out of an outlet in the collection chamber and subsequently forcing the blood within the collection chamber into the patient's circulatory system.

4,501,582

PERFUSION KIT

Volker Schulz, Laudahnstrasse 37, Koln 41, Fed. Rep. of Germany

Continuation of Ser. No. 328,208, Dec. 7, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,566

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048211

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—52 **4 Claims**

1. Sodium nitroprusside-sodium thiosulfate perfusion kit comprising the following components:
1. a sealed container of sodium thiosulfate aqueous solution, said container having a penetrable closure,
2. a syringe of light-opaque material with attached cannula adapted to penetrate said closure, to obtain a prescribed volume of said solution,
3. perfusion tubing of light-opaque plastic material adapted to be attached to said syringe, and
4. a sealed container of dry solid sodium nitroprusside adapted to be dissolved by said aqueous solution to form a mixed stable aqueous solution in said syringe, the amount of said sodium nitroprusside being from ½ to 1/20 of the weight of said sodium thiosulfate present in said solution in said syringe,

wherein said mixed stable aqueous solution may be safely injected into a patient.

4,501,583

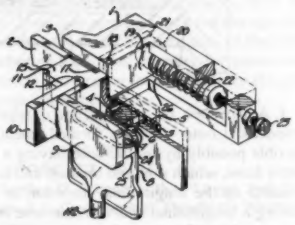
HEMODIALYSIS ACCESS MONITORS

Vernon H. Troutner, St. Petersburg, Fla., assignor to Extracorporeal, Inc., King of Prussia, Pa.

Filed Jun. 15, 1983, Ser. No. 504,659

Int. Cl.³ A61B *5/02;* **A61M** *5/00, 1/03;* **G01L** *7/08*

U.S. Cl. 604—118 **19 Claims**



1. A fluid pressure monitor for detecting the presence of first and second opposite pressure levels relative to an intermediate pressure level in a flexible fluid tubing segment comprising:
first detection means located on one side of said tubing segment, and responsive to the attainment of said first pressure level in said tubing segment for detecting said first pressure level;
lever means having a proximal end located on the other side of said tubing segment from said first detection means for

retaining said tubing segment between said first detection means and said lever means, a distal end, and a pivot point intermediate said proximal and distal ends for pivoting said lever means in the presence of pressure changes in said tubing segment; and

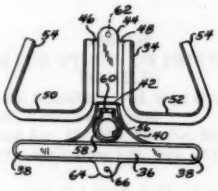
second detection means, activated by said distal end of said lever means upon the attainment of said second pressure level in said tubing segment, for detecting said second pressure level.

4,501,584

LIQUID DRAINAGE SYSTEM WITH FORMED HINGED SUPPORT SHEET

James P. Cianci, Cary, and William J. Dunn, Libertyville, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 4, 1983, Ser. No. 472,402
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—322 **4 Claims**



1. A liquid drainage system, comprising:

a receptacle having a chamber to receive the liquid;

a drainage tube communicating with the chamber;

a formed sheet of flexible material, with said sheet being of one-piece construction, said sheet having an elongated bar received in an upper portion of the receptacle, a first connecting portion extending from one side of the bar at a generally central location thereof, a first hinge extending across the sheet at an outer end of the first connecting portion, a second elongated connecting portion extending from the first hinge on a side of the first hinge opposite the first connecting portion, said second connecting portion being flexed about the first hinge to align the first and second connecting portions in a facing relationship, second and third hinges extending along opposed sides of the second connecting portion, and first and second hook members connected to said second and third hinges, with the hook members having downwardly extending outer ends, said hook members being movable between a first position generally perpendicular to the receptacle to support the receptacle from an object, and a second position generally aligned with the receptacle with the outer ends of the hook members being located in front of said bar to form a handle to carry the receptacle including means for securing the first and second connecting portions in the facing relationship.

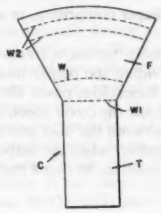
4,501,585

MOTHER'S MILK HARVESTING AND COLLECTION DEVICE

Laura L. Friedman, 6348 Trotwood, Portage, Mich. 49008

Filed Aug. 23, 1982, Ser. No. 410,381
Int. Cl.³ A61F *5/44*
U.S. Cl. 604—346 **13 Claims**

1. A collapsible mother's-milk harvesting device, suitable for the collection of mother's milk from a human milk-providing breast, adapted, in the collapsed mode to lie flat and, in the opened-up mode to form an essentially single integral liquid-tight receptacle comprising an upper breast-receiving portion means and a lower milk-receiving portion, said upper portion means, in the opened-up mode, being adapted for the reception of a breast therein, and said lower portion means, in the same



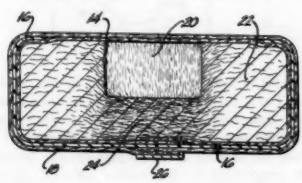
mode, being in internal communication with said upper portion means and having a size and shape to permit its disposition in a plastic-film-baby-bottle holding device as the milk-containing container-liner thereof, and said lower portion means having an upper section adapted to be rolled down over the open end of a plastic-film-baby-bottle holding device having an outer wall and to be held in place thereon between the outer wall thereof and a wall of a nipple.

4,501,586

ABSORBENT STRUCTURE WITH RESERVOIR

Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 207,524, Nov. 17, 1980,. This application Mar. 11, 1983, Ser. No. 474,396
Int. Cl.³ A41B *13/02*
U.S. Cl. 604—380 **6 Claims**



1. An absorbent structure suitable for absorption of body fluids comprising a moisture-impermeable backing sheet; an absorbent, loosely-compacted, cellulosic fibrous batt, superimposed on said backing sheet; and a moisture-permeable fabric cover, covering at least the side of said absorbent batt opposite said backing sheet, said absorbent batt being provided with a reservoir having a capacity of at least 10 cc, covers at least one square inch but does not cover more than 25% of the surface of said absorbent batt said reservoir being situated between the center and one transverse end and being formed by compression of the cellulosic fibrous batt such that the depth of said reservoir is more than one-half the thickness of said absorbent batt.

4,501,587

DISPOSABLE DIAPER HAVING IMPROVED ABSORBENT PAD ARRANGEMENT

Kenneth M. Enloe, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

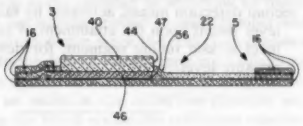
Filed Sep. 30, 1982, Ser. No. 430,621
Int. Cl.[3] A61F *13/16*
U.S. Cl. 604—385 13 Claims

1. A disposable diaper comprising, in combination:

a crotch area;

a main pad assembly having a transverse fold line in the crotch area dividing the diaper into front and rear sections, a liquid impervious cover sheet, a liquid pervious liner sheet opposite the cover sheet, and a main absorbent pad disposed between the liner and cover sheets;

the main pad assembly, when the diaper is in at least a partially folded condition, having a pair of longitudinal fold portions extending toward the longitudinal centerline of the diaper, said fold portions including a portion of the main absorbent pad and having spaced apart opposed



edges defining a space between the fold portions; and

an auxiliary absorbent pad positioned between the opposed edges of the fold portions in said space only in said front section and said diaper.

4,501,588

INSTANT THREAD DYEING METHOD FOR SEWING MACHINE

Ryoichi Suzuki, and Yoshio Yamaguchi, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Oct. 13, 1982, Ser. No. 434,147
Claims priority, application Japan, Oct. 13, 1981, 56-162026
Int. Cl.³ D06P 5/20
U.S. Cl. 8—444 6 Claims

1. A method for dyeing a sewing machine thread which is continuously supplied for a stitching operation, comprising the steps of:

(a) adding a coloring material to a photo-setting resin solution to prepare a dyeing liquid,

(b) continuously supplying a thread for a stitching operation

(c) applying said dyeing liquid to said continuously supplied thread, and

(d) irradiating said thread with ultraviolet rays for setting said dyeing liquid on said thread.

4,501,589

PROCESS FOR DYEING OR PRINTING SIZED TEXTILES

Christian Oschatz, Schallbach, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basle, Switzerland

Filed Jun. 10, 1983, Ser. No. 503,271
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222080
Int. Cl.³ D06P 1/44, 3/42
U.S. Cl. 8—495 26 Claims

1. A process for dyeing or printing a warp sized woven textile substrate which comprises applying to said sized substrate a dyeing liquor or printing paste comprising, in addition to one or more dyestuffs,

(i) a non-ionic anionic or cationic surfactant and

(ii) a textile size or mixture of textile sizes.

4,501,590

INSTANT THREAD DYEING METHOD FOR SEWING MACHINES

Ryoichi Suzuki, and Yoshio Yamaguchi, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Jun. 24, 1983, Ser. No. 507,411
Claims priority, application Japan, Jun. 25, 1982, 57-108497
Int. Cl.³ D06P 5/02
U.S. Cl. 8—495 6 Claims

1. A method for dyeing a continuously supplied sewing machine thread comprising the steps of:

(a) preparing a coloring liquid consisting of 2–15 wt.% of a coloring paste containing 20–40 wt.% of a pigment formed of particles having a diameter not more than 5 microns, 15–30 wt.% of an emulsion containing 30–40 wt.% of an acrylic resin, and the remainder water;

(b) providing a continuously supplied sewing machine thread,

(c) uniformly applying said coloring liquid to said thread;

(d) bringing said thread into contact with a hot plate heated to a temperature of 180°–240° C. for 1–3 seconds, thereby drying and setting said coloring liquid on said thread; and

(e) successively supplying the colored thread for a stitching operation with a sewing machine.

4,501,591

PROCESS FOR CONVENIENTLY PROVIDING STAIN-RESISTANT POLYAMIDE CARPETS

Pompelio A. Ucci, Pensacola, and Randolph C. Blyth, Gulf Breeze, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 565,439, Dec. 27, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,259
Int. Cl.³ D06P 1/56, 3/24, 1/673
U.S. Cl. 8—495 10 Claims

1. In a process for continuously dyeing a carpet having a pile consisting essentially of polyamide fibers wherein an endless length of the carpet is passed through a treating zone in which the carpet is first prewetted, then treated with an aqueous dye liquor wherein the liquor ratio is in the range of 1.5:1.0 to 4.5:1.0, then, subjected to an atmosphere of steam to fix the dye on the carpet, then washed with water to remove residual liquor from the carpet and, finally, dried, the improvement of imparting stain resistance to the carpet comprising adding a silicate of the formula $M_2O.mSiO_2$ and either a sulfonated phenol-formaldehyde condensation product or a sulfonated naphthol-formaldehyde condensation product or mixtures thereof to the liquor each in an amount sufficient in combination to impart stain resistance to the carpet, where M is an alkali metal and m is a number ranging from about 0.5 to 2.0.

4,501,592

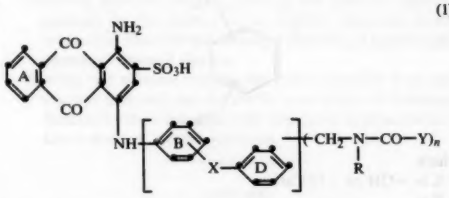
ANTHRAQUINONE DYES, PROCESS FOR THEIR PREPARATION, AND USE THEREOF

Jean-Marie Adam, Rosenau, France, and Peter Bloch, Muttenz, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 10, 1983, Ser. No. 521,904
Claims priority, application Switzerland, Aug. 23, 1982, 5000/82
Int. Cl.³ C09B 1/34; D06P 1/40
U.S. Cl. 8—676 15 Claims

1. A dye of the formula

(1)



wherein X is oxygen or sulfur, R is hydrogen or C_1–C_4alkyl, Y is an unsubstituted or substituted aryl radical, n is 1, 2 or 3, the benzene ring A may be substituted by halogen and the benzene rings B and D may each independently be substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy or a radical of the formula —O—CH_2CH_2—O—R_1, wherein R_1 is hydrogen, methyl or ethyl.

4,501,593

PROCESS FOR THE PRODUCTION OF AGGLOMERATED FUELS

Michael Paersch, Aachen; Herbert Mrotzek; Helmut Haukelt, both of Hamburg, and Heinz-Wilhelm Schreckenberg, Brilon, all of Fed. Rep. of Germany, assignors to The British Petroleum Company p.l.c., London, England

Filed Jun. 9, 1983, Ser. No. 502,747
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223194
Int. Cl.³ C10L 5/16, 5/22
U.S. Cl. 44—23 10 Claims

1. A process for the pelletization of finely divided solid carbonaceous material using a first binder which is a water-sol-

uble or swellable thermo-hardening material and a second binder which is an aqueous emulsion of a heavy hydrocarbon and comprising the steps of drying and then thermally hardening the pellets is characterised by the fact that by adding the first and second binder separately during the pelletization process, the concentration of the first binder in the green pellet decreasing from the interior of the exterior and that of the second binder from the exterior to the interior.

4. Process according to claim 1 characterised by the fact that the concentration gradient in the pellets is set by applying the first binder preferentially to the non-agglomerated feed to the pelletizing process or to the smaller agglomerates, and the second binder preferentially to the larger agglomerates.

6. Process according to claim 4 characterised by the fact that in the case of non-continuous production, the concentration gradient in the pellets is produced by alternating spraying with the first and second binders, the spray times for the first binder being set successively shorter and for the second binder successively longer.

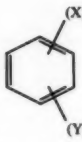
4,501,594

ANIONIC POLYHYDROXY POLYPHENYL COMPOUNDS AS DISPERSANTS FOR AQUEOUS SLURRIES OF CARBONACEOUS MATERIALS

Alphonso W. Marcellis, Boonton; Grannis S. Johnson, Plainfield, and Reuben H. Grinstein, Denville, all of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Oct. 21, 1983, Ser. No. 544,076
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—51 **12 Claims**

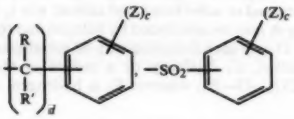
1. An aqueous carbonaceous slurry containing at least one dispersant selected from the group consisting of (a) water soluble hydroxy aromatic product having the following formula:



where

X is —OH or —O Cation

Y is



or R″

a is 1, 2 or 3; b is 0, 1 or 2

c is 0, 1 or 2; d is 0 or 1

Z is —OH or —O Cation

R and R′ are H or lower alkyl and may be the same or different

R″ is an alkyl group of 1 to 20 carbon atoms with the proviso that where a is 1, b is 0, 1 or 2 where a is 2, b is 0 or 1 and where a is 3, b is 0

which has been sulfomethylated, and (b) condensates of (a) with from about 0.25 to about 3.0 moles of formaldehyde per mole of (a), said dispersant present in an amount of from about 0.05% by weight to about 2.0% by weight of the carbonaceous material present in the slurry.

4,501,595

MIDDLE DISTILLATE FUEL OIL OF IMPROVED STORAGE STABILITY CONTAINING CONDENSATE OF MANNICH BASE AND ALKENYL SUCCINIC ACID ANHYDRIDE

Rodney L. Sung, Fishkill, and Thomas J. Karol, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 25, 1984, Ser. No. 613,925
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—57 **14 Claims**

1. A middle distillate fuel oil composition characterized by improved storage stability which comprises

a major portion of a middle distillate fuel oil; and

a minor stability-improving amount of an additive prepared by reacting (i) a primary or secondary polyamine, (ii) an aldehyde, and (iii) a phenol containing an active hydrogen thereby forming a phenol-aldehyde-amine condensate;

reacting said phenol-aldehyde-amine condensate with (iv) a succinic acid anhydride bearing a polyolefin-derived substituent containing residual unsaturation thereby forming product phenol-aldehyde-amine Mannich condensate polyamine succinimide; and

recovering said product phenol-aldehyde-amine Mannich condensate polyamine succinimide.

4,501,596

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1983, Ser. No. 566,463
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—63 **9 Claims**

1. A gasoline composition containing an antiknock quantity of an additive selected from 1-oxa-3-azacyclopent-2-ene; 1-oxa-3-azacyclopent-3-ene; 1-oxa-3-azacyclopent-4-ene; 1-oxa-3-azacyclopent-2,4-diene and hydrocarbyl substituted derivatives of these compounds.

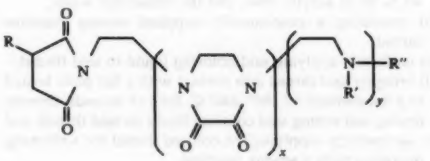
4,501,597

DETERGENT FUEL COMPOSITION CONTAINING ALKENYLSUCCINIMIDE OXAMIDES

Thomas J. Karol, Wappingers Falls, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

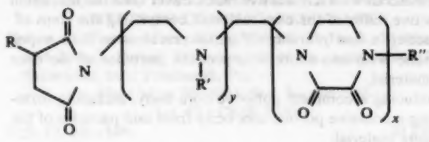
Filed Jul. 2, 1984, Ser. No. 627,134
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—63 **7 Claims**

1. A fuel composition comprising a mixture of hydrocarbons boiling in the gasoline boiling range and containing an effective detergent amount of detergent compound of the formula selected from the group consisting of I, II, and mixtures thereof,



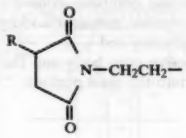
I

-continued



II

in which R is a hydrocarbyl radical having from 8 to 400 carbon atoms, x and y are numbers which range from 0 to 6 whose additive total is from 1 to 6 and which can be the same or different, R' is a hydrogen radical or a mono- or bi-acyl radical of oxalic acid, and R'' is a hydrogen or hydrocarbyl substituted succinic-N-ethylene radical of the formula:



Wherein from about 40 to 100 wt% of said detergent compound is the oxalic acid derivative of mono-succinimide and the remainder comprises the oxalic acid derivative of bis-succinimide.

4,501,598

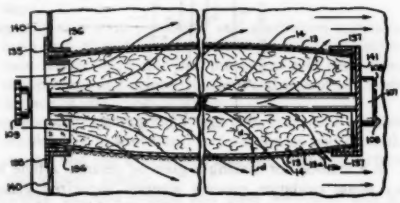
GAS BORNE PARTICLE FILTERING METHOD

James Long, Bloomfield Hills, Mich., assignor to James M. Hammond, East Lansing, Mich., a part interest

Continuation-in-part of Ser. No. 319,264, Nov. 9, 1981, Pat. No. 4,378,980. This application Nov. 8, 1982, Ser. No. 440,171

Int. Cl.³ B03C *3/64*

U.S. Cl. 55—2 **12 Claims**



1. In a method of filtering gas borne particles in a filtering apparatus wherein inlet and outlet openings (**11** and **12**) in the apparatus are separated by a filter medium (**13**) mounted on a porous support (**14**) for filtration, the improvement which comprises:

(a) providing a small mesh screen as the porous support (**14**) composed of polymeric strands, the screen having a mesh size of about 6 or greater, in contact with the filter medium (**13**) which is non-metallic and has a density of about 3.2×10^{-3} to 6.28×10^{-1} grams per cubic centimeter wherein upon interaction of the screen in contact with the filter medium during gas flow across an exposed surface of the filter medium opposite the contact with the screen by a fluttering movement of the filter medium on the screen an electrostatic charge is created which attracts 0.1 micron and larger sized particles to the filter medium for removal from the gas; and

(b) flowing a gas along the surface of the filter medium, through the filter medium and then the screen at a gas velocity of between about 25 and 1000 feet per minute at a pressure drop across the filter medium of less than about 2 inches of water, wherein an increasing percentage of the particles of a particular size are removed as a result of particle loading of the filter medium during filtration.

4,501,599

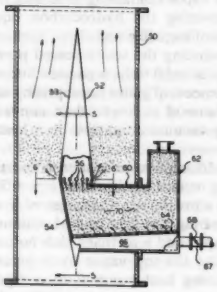
METHOD AND APPARATUS FOR CLEANING WASTE GASES FROM ALUMINUM PRODUCTION FACILITIES

Isaias Loukos, Knoxville, Md., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 327,360, Dec. 4, 1981, abandoned. This application Mar. 1, 1983, Ser. No. 470,787

Int. Cl.³ B01D *53/06*

U.S. Cl. 55—71 **14 Claims**



11. A method of removing hydrogen fluoride, finely divided solids and hydrocarbons from gases evolved from aluminum reduction potlines and anode fabrication baking plants comprising the steps of:

conducting the gases through a vertical scrubbing chamber having a constant cross-sectional area from its lower to its upper end,

fluidizing alumina particles, flowing said fluidized alumina particles to the interior of an injector disposed axially within said chamber and having a plurality of spaced apart openings disposed therein,

flowing said alumina particles by gravity radially from said injector into said gas stream for adsorption of hydrogen fluoride by the alumina and the deposit of hydrocarbons in finely divided alumina particles.

4,501,600

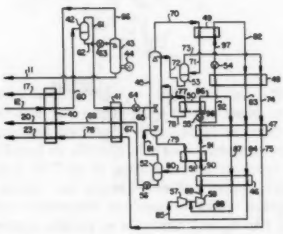
PROCESS TO SEPARATE NITROGEN FROM NATURAL GAS

Ravindra F. Pahade, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 15, 1983, Ser. No. 514,338

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—28 **13 Claims**



1. In a process for removing nitrogen from natural gases

wherein a nitrogen-containing hydrocarbon stream is first separated into a liquid, containing primarily hydrocarbons having two or more carbon atoms, and into a vapor containing primarily nitrogen and methane, and wherein the vapor stream is further separated in one or more rectification columns into nitrogen and methane, the improvement comprising recovering substantially all of the hydrocarbons containing two or more carbon atoms which were present in the nitrogen-containing hydrocarbon stream by the steps of:

(a) cooling the vapor after the first separation by at least 10° K. to partially condense it;

(b) introducing the condensed portion into a stripping column where it is separated into a liquid, containing primarily hydrocarbons having two or more carbon atoms, and into a vapor containing primarily methane;

(c) recovering the hydrocarbon liquid and the methane vapor of step (B); and

(d) introducing the uncondensed portion into the rectification column(s) to be separated into nitrogen and methane.

6. The process of claim 1 comprising maintaining said rectification column(s) at lower than conventional pressures, but precluding vacuum conditions in a heat pump circuit by the steps of:

(a) introducing said uncondensed portion as a nitrogen-containing natural gas feed into a rectification column operating at a pressure in the range of from 200 to 450 psia;

(b) separating the feed in said column into a nitrogen-rich top vapor and a methane-rich bottom liquid;

(c) cooling the top vapor by indirect heat exchange with vaporizing heat pump fluid comprising from 0.5 to 60 mole percent nitrogen and 99.5 to 40 mole percent methane, to partially condense said top vapor;

(d) returning the condensed portion of the top vapor to the column as liquid reflux and removing from the process the uncondensed portion of the top vapor as nitrogen;

(e) warming the bottom liquid by indirect heat exchange with condensing said heat pump fluid to partially vaporize said bottom liquid; and

(f) returning the vaporized portion of the bottom liquid to the column as vapor reflux and recovering the unvaporized portion as product natural gas;

wherein said heat pump fluid is at all times at or greater than ambient pressure.

4,501,601

PROCESS FOR MANUFACTURING GLASS FIBER OPTICAL WAVEGUIDES

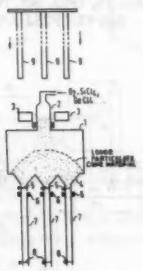
Herbert Haupt, Moglingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 5, 1983, Ser. No. 492,460

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217965

Int. Cl.³ C03B *37/01*

U.S. Cl. 65—2 **17 Claims**



1. A process for manufacturing glass preforms for use in drawing glass fiber optical waveguides therefrom, each having a core of a core material surrounded by a cladding of a cladding material with a refractive index lower than the maximum refractive index of the core material, comprising the steps of

reacting a first plurality of initial reactants in their vapor state with one another to produce particles of the core material,

producing a complete cohesive core body, including forming a cohesive porous core body from said particles of the core material;

reacting a second plurality of initial reactants in their vapor state with one another to produce particles of the cladding material;

providing a cohesive porous cladding body from said particles of the cladding material around said complete cohesive core body to thereby form a composite body, including accumulating the particles of the cladding material remotely from said complete cohesive core body, and forming the cohesive porous cladding body from the accumulated particles; and

sintering the cohesive core body and the cohesive porous cladding body into the glass preform.

4,501,602

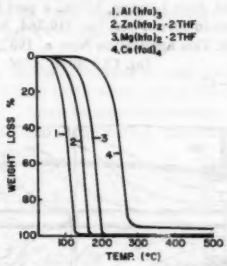
PROCESS FOR MAKING SINTERED GLASSES AND CERAMICS

Stephen B. Miller, Corning; Ronald L. Stewart, Big Flats, and David A. Thompson, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,215

Int. Cl.³ C03B *19/06*

U.S. Cl. 65—18.2 **5 Claims**



1. In a method for making a glass or ceramic article by a vapor phase oxidation process wherein vaporized glass or ceramic source compounds are oxidized while in the vapor phase to form particulate oxide soot, the oxide soot is captured as deposited soot in a collection container or on a deposition substrate, and the deposited soot is sintered by heating to form a void-free, monolithic self-supporting glass or ceramic article, the article having a composition which includes at least one modifying oxide of a metal selected from Groups IA, IB, IIA, IIB, IIIA, IIIB, IVA, IVB and the rare earth series of the Periodic Table, the improvement wherein:

(a) the vaporized source compound for at least one of the constituent metal oxides of the article is a β-diketonate complex of the selected metal;

(b) the β-diketonate complex of the selected metal exhibits a vapor pressure of at least 10 mm (Hg) at a temperature below 250° C.;

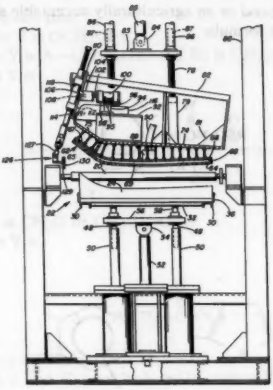
(c) the β-diketonate complex can be vaporized at a temperature below 250° C. without significant thermal decomposition, as evidenced by thermogravimetric analysis; and

(d) the vaporized β-diketonate complex can be and is oxidized in the vapor phase to produce oxide particles of the selected metal wherein the oxide particles do not exceed about 0.1 microns in diameter.

4,501,603
METHOD AND APPARATUS FOR SHAPING GLASS SHEETS TO COMPLICATED SHAPES

Robert G. Frank, Murrysville; Michael T. Fecik, Pittsburgh, and John J. Ewing, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 30, 1983, Ser. No. 480,535
Int. Cl.[3] C03B *23/035*
U.S. Cl. 65—106 23 Claims



1. A method of bending a glass sheet to a shape having an end portion bent relative to a main portion of said glass sheet comprising.

heating said glass sheet to a deformation temperature;

drawing a vacuum through an apertured shaping surface of a vacuum holder, said apertured shaping surface having an apertured end area bent relative to a main area and substantially conforming to a shape desired for said glass sheet;

engaging said main portion of said glass sheet against said main area of said apertured shaping surface of said vacuum holder while said end portion of said glass sheet is unsupported and spaced from said end area of said shaping surface of said vacuum holder;

engaging said end portion of said glass sheet with a movable shaping rail to move said end portion of said glass sheet against said end area of said apertured shaping surface of said vacuum holder;

retaining said end portion and main portion of said glass sheet in vacuum engagement with said end area and main area of said shaped surface while said movable shaping rail biases said end portion of said glass sheet against said end area of said vacuum holder until said glass sheet conforms throughout its entire extent including said end area to the apertured shaping surface; and

disengaging said end portion of said glass sheet and said shaping rail from one another while said end portion and main portion of said glass sheet are retained in vacuum engagement with said apertured shaping surface of said vacuum holder.

11. Apparatus for bending hot glass sheets comprising:

a shaping station having a vacuum holder with an apertured shaping surface having an apertured end area bent with respect to a main portion of said apertured shaping surface conforming to a shape desired for said glass sheet;

a shaping rail associated with said vacuum holder having a glass sheet engaging surface;

means to move said shaping rail away from said end area into a clear position to allow said glass sheet to be shaped to move into alignment with said vacuum holder;

means to provide relative motion between said glass sheet to be shaped and said vacuum holder to engage the main portion of said glass sheet against the corresponding main area of said vacuum holder; and

means to move said shaping rail toward said apertured end area into an engaging position to move said end portion of said glass sheet to be shaped against said apertured end area of said vacuum holder and maintain it thereagainst.

4,501,604
METHOD OF PREPARING ARTIFICIAL FERTILE SOIL

Keikichi Ōdaira, Tokyo, Japan, assignor to Yojigen Agricultural Corporation, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,552
Claims priority, application Japan, Feb. 26, 1982, 57-28947
Int. Cl.[3] C05F *1/00, 3/00, 11/08*
U.S. Cl. 71—15 29 Claims

1. A method of preparing artificial fertile soil, comprising the steps of:

(a) raising four-footed livestock under densely populated conditions on a first litter comprising pulverized wood, allowing excrement produced by said livestock to mix with said first litter until the moisture content of said mixture of said first litter and livestock excrement is 60 to 90% by weight based on the weight of said mixture to thereby obtain a first intermediate material;

(b) mixing the first intermediate material with a crushed animal carcass material in an amount of from 5 to 20% by weight based on the weight of said first intermediate material and allowing the resulting product to undergo natural fermentation until said crushed animal carcass material is substantially decomposed to thereby form a second intermediate material;

(c) adding earthworms to the second intermediate material and maintaining the earthworms in said second intermediate material under breeding conditions for more than 9 months to thereby form a third intermediate material; and

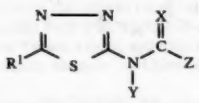
(d) raising poultry under densely populated conditions on a second litter containing said third intermediate material and allowing excrement produced by said poultry to mix with said second litter until the moisture content of said mixture of said second litter and said poultry excrement is 40 to 60% by weight based on the weight of said mixture.

4,501,605
HERBICIDAL HETEROCYCLIC COMPOUNDS AND COMPOSITIONS

Thomas L. Hough, Linton, and Graham P. Jones, Babraham, both of England, assignors to FBC Limited, England

Filed Feb. 2, 1983, Ser. No. 463,071
Claims priority, application United Kingdom, Feb. 4, 1982, 8203223
Int. Cl.[3] C07D *285/12;* A01N *43/82*
U.S. Cl. 71—90 9 Claims

1. The thiadiazoles of the formula:



(I)

(wherein:

R^1 represents a group R^a, $-S(O)nR^a$ or $-SO_2NR^aR^b$, where R^a and R^b, which may be the same or different, each represent hydrogen, cycloalkyl of 3 to 7 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms, phenyl, phenylalkyl of 7 to 10 carbon atoms, or alkyl of 1 to 10 carbon atoms, any phenyl or alkyl group present being optionally substituted by one or more halogen atoms, cyano groups, alkoxy or alkylthio groups of 1 to 4 carbon atoms, or phenoxy groups, or R^a and R^b together form an alkylene chain of 2 to 6 carbon atoms, and n represents 0, 1 or 2;

X represents oxygen or sulphur;
Z represents a group —NR^cR^d; and
Y represents a group —NR^cR^f or a group —$N{=}CR^cR^f$; where R^c, R^d, R^e and R^f, which may be the same or different, each represent a group as defined for R^a, or a carboxy, alkoxy, alkoxycarbonyl, carboxylic aryl, carboxylic acyloxy alkylsulphonyl, cyano, formyl or amido, any alkyl moiety of which is of 1 to 4 carbon atoms);
and the acid addition salts thereof.

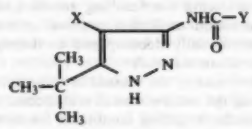
4,501,606

HERBICIDAL 5-T-BUTYL-3-PYRAZALYLCARBAMATES AND UREAS

Nansho Seki; Yuki Yamaguchi; Yukihiro Nakamura; Hiroshi Kubo, and Tetsuo Tsuruya, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,630
Claims priority, application Japan, Feb. 18, 1982, 57-23668; Feb. 18, 1982, 57-23669; Nov. 8, 1982, 57-194592
Int. Cl.³ A01N *43/56*; C07D *231/38*
U.S. Cl. 71—92 **9 Claims**

1. A pyrazole derivative represented by the formula [I]:

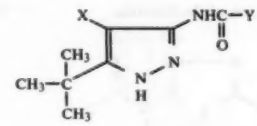


[I]

wherein X is a hydrogen atom, a chlorine atom or a bromine atom; and Y is (1) an —OR group wherein R is a lower alkyl group, a lower alkenyl group, or a lower alkynyl group, or (2) an

group wherein R′ and R″, which may be the same or different, are each a lower alkyl group.

9. A method for inhibiting the growth of weeds comprising applying to a plant or locus, a herbicidally effective amount of a pyrazole derivative represented by the formula [I]:



[I]

wherein X is a hydrogen atom, a chlorine atom or a bromine atom; and Y is (1) an —OR group wherein R is a lower alkyl group, a lower alkenyl group, or a lower alkynyl group, or (2) an

group wherein R′ and R″, which may be the same or different, are each a lower alkyl group.

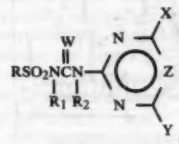
4,501,607

HERBICIDAL TRIAZINE SULFONAMIDES

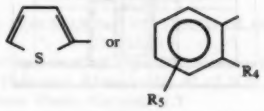
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 63,208, Aug. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 946,176, Sep. 27, 1978, Pat. No. 4,214,890. This application Jan. 30, 1980, Ser. No. 116,920
Int. Cl.³ C07D *251/46, 251/18, 251/52*; A01N *43/70*
U.S. Cl. 71—93 **27 Claims**

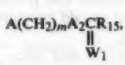
1. A compound or an agriculturally acceptable salt thereof, which has the formula:



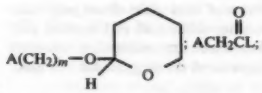
wherein
R is

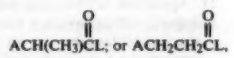


R_1 and R_2 are independently H or CH_3;
R_4 is Cl, Br, F, NO_2, CH_3, OCH_3, CF_3 or $R_3S(O)_n$, where R_3 is C_1–C_6 alkyl or C_3–C_4 alkenyl;
R_5 is H, Cl, Br, F, CH_3 or —OCH_3;
n is 0, 1 or 2;
W is O or S;
X is CH_3 or —OCH_3;
Y is C_3–C_4 alkyl; C_2–C_4 alkyl substituted with CH_3O; C_2–C_4 alkyl substituted with 1–3 atoms of Cl, Br or F; C_1–C_4 alkyl substituted with C_2H_5O, CN, CO_2H, CO_2CH_3 or $CO_2C_2H_5$; CH_2F; CH_2Cl; CH_2Br; C_2–C_4 alkenyl; C_2–C_4 alkynyl; SCN; N_3; $A(CH_2)_mA_1R_7$, where m is 2 or 3; R_7 is C_1–C_3 alkyl; A is O or S; and A_1 is O or $S(O)_n$;



where A_2 and W_1 are independently O or S, and R_{15} is C_1–C_3 alkyl, optionally substituted with 1–3 F, Cl or Br, or R_{15} is $N(CH_3)OCH_3$ or NR_8R_9;





where L is $N(CH_3)OCH_3$ or NR_8R_9, where R_8 and R_9 are independently H, CH_3 or C_2H_5, or L is OR_{10} where R_{10} is H or C_1–C_4 alkyl; $NR_{11}R_{12}$ where R_{11} is H or CH_3 and R_{12} is C_3–C_4 alkenyl, C_2–C_3 alkyl substituted with OCH_3 or OC_2H_5, cyclopropyl or C_1–C_2 alkyl substituted with CN, CO_2CH_3 or $CO_2C_2H_5$; OR_{13} where R_{13} is C_4–C_6 alkyl, C_1–C_4 cyanoalkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl,

or C_2–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br; SR_{14} where R_{14} is C_1–C_2 cyanoalkyl, allyl or propargyl; and

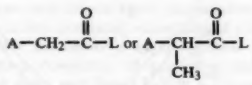
Z is N;

with the proviso that:

(1) (a) when Y is OCH_2CF_3;

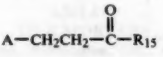
(b) when Y is $A—(CH_2)_mOR_7$ and R_7 is CH_3 or CH_3CH_2;

(c) when Y is



and L is CH_3O or CH_3CH_2O; or

(d) when Y is



and R_{15} is CH_3 or CH_3CH_2,

then in a, b, c or d, R_4 must be $R_3S(O)_n$, where R_3 is other than CH_3; and

(2) when either or both of R_1 and R_2 is CH_3, Y cannot be $OCH_2CH_2OCH_3$.

19. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,501,608

NITROSAMINE INHIBITION

William N. Cannon, Cumberland, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 16, 1983, Ser. No. 495,273

Int. Cl.³ A01N *25/22*

U.S. Cl. 71—121 **16 Claims**

1. A process for stabilizing a dinitroaniline herbicide against formation of nitrosamines, said dinitroaniline herbicide being selected from the group consisting of

trifluralin,
isopropalin,
benefin,
ethalfluralin,
butralin,
pendimethalin,
fluchloralin,
profluralin,
dinitramine,
chlornidine,
oryzalin,
nitralin,
prosulfalin, and
prodiamine

which process comprises adding to the dinitroaniline herbicide, while in a molten state, an effective amount of an addition compound of an alkali metal or ammonium bisulfite and an aldehyde or ketone of the formula

wherein R^1 and R^2

(1) are taken separately and

(a) R^1 represents hydrogen or methyl, and R^2 represents hydrogen or lower alkyl of C_1–C_3, or

(b) R^1 represents hydrogen and R^2 represents phenyl, 2-phenylvinyl, or benzyl; or

(2) are taken together and constitute, with the carbonyl function, a cycloalkanone containing from 5 to 8 carbon atoms.

4,501,609

METHOD AND APPARATUS FOR THE SINTERING OF A MINERAL USING GASEOUS FUEL

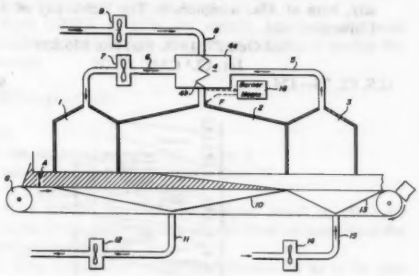
Jean-Pierre Druet, Thionville, France, assignor to Société Lorraine de Laminage Continu SOLLAC, Florence, France

Filed Jan. 24, 1984, Ser. No. 573,474

Claims priority, application France, Jan. 27, 1983, 83 01251

Int. Cl.³ C22B *1/16*

U.S. Cl. 75—5 **3 Claims**



1. Method for the sintering of a noncombustible ore, comprising the steps of

(a) arranging a layer of said ore and other noncombustible consituent elements for sintering on a supporting grate; and

(b) passing hot fumes produced from the combustion of gaseous fuel downwardly through said layer, the temperature of said hot fumes being sufficient to initiate fusion of said ore thereby to form a sinter.

4,501,610

FINE PARTICLES OF FERROMAGNETIC METAL AND PROCESS FOR PRODUCING THE SAME

Kazumasa Yazu; Yasuto Adachi, and Takayoshi Yoshizaki, all of Minamata, Japan, assignors to Chisso Corporation, Ohsaka, Japan

Filed Feb. 23, 1984, Ser. No. 582,709

Claims priority, application Japan, Feb. 23, 1983, 58-28987

Int. Cl.³ H01F *1/06, 1/33*

U.S. Cl. 75—0.5 AA **17 Claims**

1. A process for producing fine acicular particles of ferromagnetic metal comprising:

providing an aqueous suspension of at least one of acicular iron oxide and acicular iron oxyhydroxide;

adding a solution of a salt of an organic acid and a non-alkali, non-ferrous metal hereinafter called different metal, to the aqueous suspension to adhere the different metal to the acicular iron; and

subjecting the adhered acicular iron to a reduction process.

4,501,611

POWDER FORGING OF ALUMINUM AND ITS ALLOYS

Alan R. Begg, Ascot, England, assignor to British Petroleum Company, London, England

Filed Feb. 24, 1984, Ser. No. 583,107

Claims priority, application United Kingdom, Mar. 15, 1983, 8307158

Int. Cl.³ B22F 9/00

U.S. Cl. 75—0.5 R 10 Claims

1. A powder of aluminium or an alloy thereof capable of being powder forged and having at least 0.04% w/w of gallium concentrated on the grain boundaries of the particles in the powder.

4,501,612

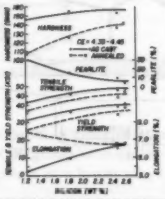
COMPACTED GRAPHITE CAST IRONS IN THE IRON-CARBON-ALUMINUM SYSTEM

Doru M. Stefanescu, Tuscaloosa, and Freddy Martinez, University, both of Ala., assignors to The University of Alabama, University, Ala.

Filed Oct. 27, 1983, Ser. No. 545,858

Int. Cl.³ C22C 33/08

U.S. Cl. 75—124 9 Claims



INFLUENCE OF SILICON CONTENT ON THE MECHANICAL PROPERTIES OF IRON - CARBON - SILICON CAST IRONS

1. A process for producing a compacted graphite cast iron which is substantially free of carbides in castings as thin as about 0.15 inches, and with nodularities of less than 20% by volume without postinoculation, which comprises adding aluminium to a compacted graphite cast iron melt, such that the compacted graphite cast iron consists essentially of about 0.5 to 7% by weight aluminum, about 2.5 to 4% carbon, 0 to about 1.5% silicon, with the remainder iron and inevitable impurities.

4,501,613

WEAR RESISTANT SINTERED BODY

Shuji Matsumoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 14, 1983, Ser. No. 513,797

Claims priority, application Japan, Jul. 22, 1982, 57-127873; Jul. 22, 1982, 57-127874

Int. Cl.³ C22C 39/02

U.S. Cl. 75—240 2 Claims

1. A wear resistant sintered body consisting essentially of 10 to 30% by weight of chromium, 0.2 to 2% by weight of carbon, 1 to 10% by weight of nickel, and a balance consisting of unavoidable impurities and iron, and wherein a metal carbide and a metal oxide are dispersed in a matrix obtained by tempering martensite, and nitrogen is included in at least the matrix in a form of a solid solution.

4,501,614

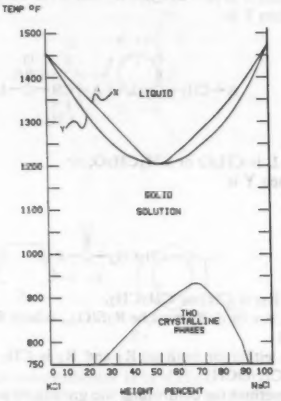
FLUX IN RECOVERY OF ALUMINUM IN REVERBERATORY FURNACE AND METHOD OF MAKING

Carl F. Bauer, Chicago, Ill.; James H. Hussey, Hammond, Ind.; Benny Langston, Barrington, and Niranjan M. Parikh, Winnetka, both of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 328,604, Dec. 8, 1981, Pat. No. 4,451,287. This application Aug. 26, 1983, Ser. No. 527,192

Int. Cl.³ C22B 21/00

U.S. Cl. 75—257 5 Claims



1. A flux composition for use in the recovery of metal from dross in a reverberatory furnace, the improvement wherein the flux consists essentially of a solid mixture which is 40% to 60% sodium chloride and 60% to 40% potassium chloride, said flux composition being produced by mechanically mixing sodium chloride and potassium chloride, heating the mixture to produce a liquid to effect complete alloying and chemical mixing thereof, cooling the mixture to solidify it, then milling the mixture to produce particles of a size no larger than 0.75 inches, said flux being functional to yield optimum metal recovery from dross type materials when used in a reverberatory furnace in a concentration ratio of 0.3 to 0.4 flux to inert ingredients.

4,501,615

ANTI-CORROSIVE PAINT

Frank Reeder, Whitburn; Michael J. Nunn; Michael J. Mitchell, both of Newcastle-upon-Tyne, and Kenneth F. Baxter, Sunderland, all of England, assignors to International Paint Public Limited Company, London, England

Filed May 31, 1983, Ser. No. 499,456

Claims priority, application United Kingdom, Jun. 1, 1982, 8216000

Int. Cl.³ C23F 11/00; C04B 31/02

U.S. Cl. 106—14.39 13 Claims

1. An anti-corrosive coating composition comprising a pigment component dispersed in a film-forming binder, in which the pigment component comprises a salt of an organic polyphosphonic acid containing at least two phosphonic acid groups and a polyvalent metal cation selected from the group consisting of zinc, manganese, magnesium, calcium, barium, aluminum, cobalt, iron, strontium, tin, zirconium, nickel, cadmium and titanium, the molar ratio of polyvalent metal cations to phosphonate groups in the salt being at least 0.8/n:1, where n is the valency of the metal cation, and the aqueous solubility of the polyphosphonate salt being 0.1–2 grams per liter, and the film-forming binder is selected from a group consisting of alkyd resin, epoxy resin, oleoresin, chlorinated rubber, polyvi-

nyl butyral, polyurethane, polyester, organic silicate, inorganic silicate, polyamide and acrylic polymer.

4,501,616

LUBRICANT AND MOLD-RELEASE AGENT FOR THE MANUFACTURE OF TIES

Hans-Ferdi Fink; Götz Koerner, both of Essen, and Rolf Freiberger, Schermbeck-Damm, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jun. 23, 1980, Ser. No. 162,209

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925662

Int. Cl.³ B28B 7/36

U.S. Cl. 106—38.22 9 Claims

1. A lubricant and release agent composition for use in the manufacture of tires consisting essentially of a lubricating and release effective amount of a water insoluble liquid selected from the group consisting of polyoxypropylenediols, and ethers of said diols, said liquid having a viscosity of at least about 8,000 mPa×sec., wherein the amount of liquid is from about 1 to 20 weight percent based on the weight of the composition.

4,501,617

TILE MORTARS

Armand J. Desmarais, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 462,507, Jan. 31, 1983, abandoned. This application Jan. 26, 1984, Ser. No. 574,228

Int. Cl.³ C04B 7/353

U.S. Cl. 106—93 12 Claims

1. In a dry mortar-forming composition having, by weight, from about 24% to about 99.4% of hyraulic cement; from about 0% to about 75% sand; and from 0.3% to about 4% of a water-retaining thickener, said dry composition being capable, when mixed with from about 25% to about 40% of its own weight of water, of producing a mortar which can be applied in thin layers for setting tile on walls and ceilings, wherein the improvement consists essentially of using as the water-retaining thickener at least one modified hydroxyethyl cellulose having a hydroxyethyl M.S. from about 0.3 to about 4.0 and a hydroxypropyl M.S. greater than 0.35.

4,501,618

METHOD OF MAKING A BUILDING MATERIAL

Georg R. U. Gebhard, Reichshof, and Klaus R. G. Hein, Bergheim-Ahe, both of Fed. Rep. of Germany, assignors to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,910

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232078

Int. Cl.³ C04B 11/00

U.S. Cl. 106—109 8 Claims

1. A method of desulfurizing a fly ash containing flue gas from a fossil fuel power plant boiler which comprises the steps of:

introducing a solid finely divided absorbent consisting at least in major part of calcium oxide, calcium hydroxide or calcium carbonate, into said flue gas and maintaining it in contact with said flue gas in a dry absorption stage for a period sufficient to enable the formation of calcium sulfate in a particulate form from said absorbent and as the predominant compound formed from said absorbent;

dry-separating particulates from said flue gas to recover a solid residue consisting essentially of said absorbent, reaction products thereof, and fly ash;

slurrying said solid residue in water to form a building material;

directly using the resulting slurry to form a structure having a determined shape; and

hardening the structure formed by said slurry.

4,501,619

AQUEOUS EMULSIONS OF CARBOXYL-CONTAINING SILICONE FLUIDS AND A METHOD FOR THEIR PREPARATION

Ronald P. Gee, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 14, 1983, Ser. No. 551,625

Int. Cl.³ C09K 3/00

U.S. Cl. 106—287.12 43 Claims

1. An aqueous emulsion comprising a combination of

(A) from 1% to 80%, by weight, based on the total weight of the emulsion, of a carboxyl-containing silicone having the formula

$$Q'Me_2SiO(Me_2SiO)_x(MeQSiO)_ySiMe_2Q'$$

wherein

Me represents the methyl radical

Q is selected from the group consisting of carboxyalkyl radicals, and carboxy ester radicals,

Q' is selected from the group consisting of Q radicals, Me radicals, and hydroxyl radicals,

x has an average value of from 20 to 290,

y has an average value of from 1 to 30,

(B) from 0.002% to 15%, by weight, based on the total weight of the emulsion, of a primary surfactant having the formula

$$RO(C_mH_{2m}O)_nH$$

wherein

m has an average value of 1, 2, or 3,

n has an average value greater than 15,

R is a hydrocarbon lipophile,

(C) from 0.002% to 15%, by weight, based on the total weight of the emulsion, of a cosurfactant selected from the group consisting of

(i) fatty acid esters of sorbitol chosen so as to be just insoluble in said carboxyl-containing silicone, and

(ii) surfactants having the formula

$$R'O(C_pH_{2p}O)_qH,$$

wherein

p has an average value of 1, 2, or 3

q has an average value large enough to render said cosurfactant just insoluble in said carboxyl-containing silicone,

R' is a hydrocarbon lipophile, and

(D) from 10% to 98.996%, by weight, based on the total weight of the emulsion, of water; with the proviso that said primary surfactant is more hydrophilic than said cosurfactant.

4,501,620

METHOD OF CLEANING A PHOTO-SENSITIVE BODY

Goro Oda, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 152,313, May 22, 1980, Pat. No. 4,364,660. This application Apr. 15, 1982, Ser. No. 368,816

Claims priority, application Japan, May 29, 1979, 54-65546; May 29, 1979, 54-65547; May 29, 1979, 54-65548

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ B08B 1/02

U.S. Cl. 134—6 5 Claims

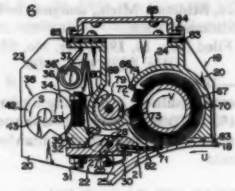
1. A method of cleaning toner from a surface of a photo-sensitive body after transfer of an image from said body comprising the steps of:

(a) bringing a cleaning blade into contact with said surface at a first contact pressure when said body is stationary;

(b) rotating said body and monotonically increasing the speed of rotation thereof to a predetermined speed;

(c) monotonically increasing the contact pressure while the

speed of said body is being increased, so that the contact pressure reaches a maximum contact pressure when the speed of rotation of said body reaches said predetermined speed; and



(d) maintaining said maximum contact pressure while said body continues rotating at said predetermined speed, so that said blade moves toner from said surface.

4,501,621

METHOD FOR REMOVING A SELENIUM LAYER FROM A SUBSTRATE

Naoto Abe; Hidetoshi Akimoto, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 274,315, Jun. 16, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,257

Claims priority, application Japan, Jun. 23, 1980, 55-83946; Jun. 30, 1980, 55-86084

Int. Cl.³ B08B *3/10, 7/04*

U.S. Cl. 134—17 **9 Claims**

1. A method of treating a substrate having a nonpermeable coating layer thereon, said method consisting essentially of

(1) exposing said substrate to a first high temperature of from about 50° C. to about 150° C. to produce cracks in said layer, then

(2) immersing said coated substrate in a volume expansive liquid so that said liquid is introduced into the cracks, and then

(3) exposing said substrate to a second high temperature which is above the boiling point of said expansive liquid to cause volume expansion of said liquid introduced into the cracks,

whereby said coating layer is removed from said substrate.

4,501,622

APPARATUS AND METHOD FOR CLEANING FLOWABLE MATERIAL FILLING DEVICES

Jean-Charles Marchadour, "La Feuillerale" Kerbascol, St. Jean Trolimon, France

Filed Nov. 8, 1983, Ser. No. 549,788

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—18 **9 Claims**

9. A process for cleaning a rotary flowable material filling device which has a hopper for holding the material, a plurality of spaced-apart filling assemblies mounted about the side exterior of the hopper, and a drive mechanism responsive to a signal for causing the hopper and filling assemblies to rotate, wherein each filling assembly includes a cylinder into which material flows from the hopper and a piston movable in the cylinder to force material from the cylinder into containers, said process including the steps of

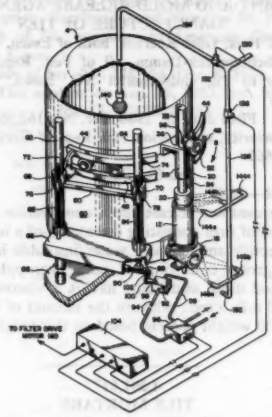
automatically operating a lifting mechanism coupled to the pistons to raise the pistons out of their respective cylinders,

activating a spraying mechanism to spray cleaning liquid against the pistons, into the cylinders, and into the hopper,

automatically operating a drive motor to cause the hopper and filling assemblies to rotate past the spraying mechanism,

deactivating the spraying mechanism to terminate spraying of the pistons, cylinders and hopper,

automatically terminating the operation of the drive motor, and



automatically operating the lifting mechanism to lower the pistons back into their respective cylinders.

4,501,623

PROCESS FOR CLEANING A BARREL

Heinz Till, Fischbacher Weg 28, and Volker Till, Eichendorffstrasse 17, both of D-6238 Hofheim, Fed. Rep. of Germany

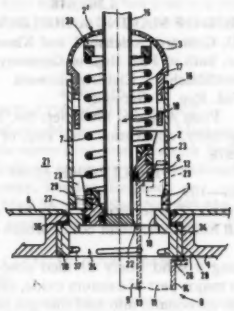
PCT No. PCT/DE82/00030, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/92705, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 15, 1982, Ser. No. 432,921

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105411; Mar. 30, 1981, 3112510; Apr. 9, 1981, 3114284

Int. Cl.³ B65B *3/04*

U.S. Cl. 134—22.18 **5 Claims**



1. In a process for cleaning a barrel provided with a bung opening in a mantle of the barrel by using an appliance for cleaning, filling and/or tapping, wherein cleaning fluid is fed into an interior of the barrel at least through a riser tube of the appliance, and where the cleaning fluid can flow off from the interior of the barrel through filling openings which are provided in the appliance in the vicinity of the barrel mantle, an improvement comprising:

also feeding cleaning fluid into the interior of the barrel through spray openings provided in a casing of the appli-

ance when a valve body of the appliance is in a selected first opening position; and

directing the cleaning fluid from the spray openings towards inner surfaces of the barrel walls, whereby the spray openings are pointed in the direction of the inner surfaces of the barrel walls.

4,501,624

FLAME-CUTTER EMPLOYING A DISCONTINUOUS OXYGEN SUPPLY FOR BILLETS PRODUCED IN A CONTINUOUS CASTER

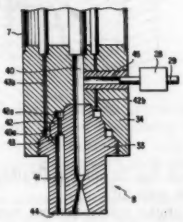
Horst K. Lotz, Wiesbaden-Delkenheim, Fed. Rep. of Germany, assignor to Aute Gesellschaft für autogene Technik mbH, Zurich, Switzerland

Filed Sep. 21, 1983, Ser. No. 534,328

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 8309304[U]

Int. Cl.³ B23K 7/02

U.S. Cl. 148—9 R **18 Claims**



1. A flame-cutter for separating a moving billet produced by a continuous caster wherein said billet is supported by at least one billet supporting roller, comprising

a burner supported for synchronous movement with said billet, said burner having a nozzle and moving along with said billet during the separation process in the direction of said billet advance;

means for supplying cutting oxygen to said burner;

means for interrupting said supply of cutting oxygen to said burner when said burner passes over each of said billet supporting rollers; and

fast-venting means coupled to said burner for reducing the amount of cutting oxygen escaping from said nozzle after interruption of said supply of cutting oxygen, whereby damage to said supporting rollers is minimized and a narrow optimized groove is cut in said billet during said separation.

4,501,625

METHOD OF PRODUCING HOMOGENEOUSLY DOPED HGCDTE WHICH CONTAINS A FAST DIFFUSING DOPANT IMPURITY

John H. Tregilgas, Richardson; Jeffrey D. Beck, Plano; Michael A. Kinch, Dallas, and Herbert F. Schaake, Denton, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1983, Ser. No. 564,953

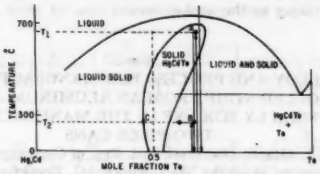
Int. Cl.³ H01L 21/324

U.S. Cl. 148—20.3 **16 Claims**

1. A method of producing homogeneously doped HgCdTe which contains a fast diffusing dopant impurity, comprising the steps of:

(a) providing a mass of HgCdTe containing said dopant impurity substantially homogeneously distributed therethrough;

(b) annealing said mass in an Hg atmosphere to fully stoichiometrically compensate all excess Te in said mass; and



(c) further annealing said mass to homogeneously distribute said dopant impurity in said mass.

4,501,626

HIGH STRENGTH STEEL PLATE AND METHOD FOR MANUFACTURING SAME

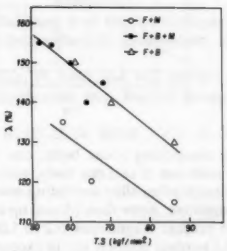
Masatoshi Sudo, Kobe; Hiromi Hori, Akashi; Takafusa Iwai, Akashi; Akinori Ohtomo, Akashi, and Denei Takai, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 15, 1981, Ser. No. 311,598

Claims priority, application Japan, Oct. 17, 1980, 55-146020; Dec. 26, 1980, 55-187196; Jan. 20, 1981, 56-7598; Mar. 3, 1981, 56-30872

Int. Cl.³ C21D 9/48, 8/04

U.S. Cl. 148—36 **22 Claims**



1. A high strength steel plate having a low yield ratio below 0.7 and improved strength-elongation balance and stretch flangeability, said steel plate containing 0.01–0.2% of C, 0.3–2.5% of Mn and 0.01–1.8% of Si and having a tripple phase of polygonal ferrite, bainite and martensite, the area ratios of said bainite and martensite phases being 4–45% and 1–15%, respectively, and the area ratio of said bainite phase being greater than that of martensite phase said martensite having an average particle size smaller than 6 microns.

9. A high strength steel plate having a low yield ratio below 0.7 and improved strength-elongation balance and stretch flangeability, said steel plate containing 0.01–0.2% of C, 0.3–2.5% of Mn and 0.01–1.8% of Si and having a triple phase of polygonal ferrite, bainite and martensite, the area ratio of said bainite and martensite phases being 4–45% and 1–15%, respectively, and the area ratio of said bainite phase being greater than that of said martensite phase said martensite having an average particle size smaller than 6 microns, said steel plate produced by a method comprising

(1) subjecting a steel material containing 0.01–0.2% of C, 0.3–2.5% of Mn and 0.01–1.8% of Si to a hot rolling-cooling treatment comprising

(i) hot rolling with a finish temperature above point Ar_3, followed by cooling from said rolling finish temperature to a temperature range of from Ar_3 to Ar_1 at an average cooling speed of 3°–70° C./sec,

(2) further cooling the hot-rolled steel plate to a temperature below 550° C. at an average cooling speed higher than 20° C./sec; and

(3) taking up the steel plate.

4,501,627

ALLOY AND PROCESS FOR MANUFACTURING ROLLED STRIP FROM AN ALUMINUM ALLOY ESPECIALLY FOR USE IN THE MANUFACTURE OF TWO-PIECE CANS

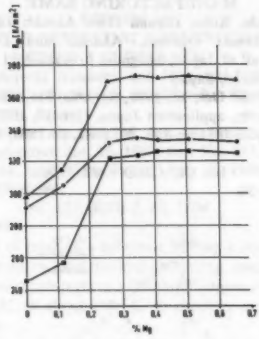
Heinz J. Althoff, Oberursel, Fed. Rep. of Germany, assignor to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 341,944, Jan. 22, 1982, Pat. No. 4,431,463. This application Dec. 1, 1983, Ser. No. 557,087

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104079; Mar. 17, 1981, 3110277

Int. Cl.³ C22C *21/00*

U.S. Cl. 148—437 **23 Claims**



1. A can comprising a can body, can top and can bottom wherein at least one of said can body, said can top and said can bottom are made of an alloy consisting essentially of 1.15 to 2.0 percent manganese, more than 1.0 and up to 2.0 percent silicon, 0.25 to 0.65 percent magnesium, 0.2 to 1.0 percent iron, not in excess of 0.3 percent copper, not in excess of 0.2 percent zinc, not in excess of 0.1 percent zirconium, not in excess of 0.1 percent titanium, balance aluminum and other impurities not in excess of a total of 0.2 percent.

4,501,628

METHOD FOR REDUCTION OF FORMALDEHYDE EMISSIONS IN WOOD COMPOSITE PANELS

Michael L. McGuire; David M. Seluga, both of Klamath Falls, and Michael R. Blum, Medford, all of Oreg., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Feb. 10, 1984, Ser. No. 578,894

Int. Cl.³ B32B *27/42*

U.S. Cl. 156—62.8 **13 Claims**

1. A method of making an aminoplast bonded, wood-based composite board having low formaldehyde emission which comprises:

a. comminuting the wood into a particulate form;

b. preparing a dry salt mixture comprising 12 to 20 parts by weight of an ammonium salt of a weak acid, said salt being decomposible by heat to yield ammonia at temperatures not exceeding about 120° C., 65 to 88 parts of a powdered amino compound selected from urea, melamine, guanidine and mixtures thereof, and 0 to 15 parts of an ammonium salt of a strong acid;

c. blending from 6 to 22% by weight, based on adhesive resin solids, of the dry salt mixture with the comminuted wood particles;

d. further blending from 4.5 to 12% by weight of wood particles on a solids basis of a liquid, aqueous aminoplast adhesive binder resin into the salt-particle mixture; and

e. forming the particles into mats and hot pressing the mats for a time and at a temperature sufficient to cure the resin binder.

4,501,629

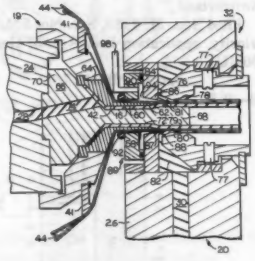
METHOD AND APPARATUS FOR EXTRUDING REINFORCED HOSE

Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 29, 1983, Ser. No. 509,107

Int. Cl.³ B29D *23/05*; B65H *81/00*

U.S. Cl. 156—149 **8 Claims**



1. A method for forming a flexible reinforced hose (**10**), comprising the steps of:

braiding a tubular reinforcement member (**16**) only directly on a mandrel (**42**), said member (**16**) having inner and outer surfaces (**17,18**);

progressively pushing the member (**16**) from the mandrel (**42**) in response to the braiding action;

extruding an elastomeric liner (**21**) from a first extruder (**24**) onto the inner surface (**17**) of the braided reinforcement member (**16**) as the member (**16**) is being pushed from the mandrel (**42**);

extruding an elastomeric cover (**22**) from a second extruder (**26**) onto the outer surface (**18**) of the braided reinforcement (**16**), said extruding of the elastomeric liner (**21**) and cover (**22**) occurring at approximately the same axial location and adjacent the mandrel (**42**);

pulling the reinforced hose (**10**) after it exits the second extruder (**50**) at a linear rate faster than the rate of reinforcement member (**16**) is changed to a predetermined braid angle; and

holding the hose (**10**) to maintain the braid angle of the hose (**10**) at the predetermined braid angle for subsequent curing.

4. An apparatus (**12**) for forming a flexible reinforced hose (**10**), comprising:

a mandrel (**42**) having a first end portion (**62**);

a braiding machine (**14**) adapted to progressively braid a tubular reinforcement member (**16**) only directly on the mandrel (**42**), the reinforcement member (**16**) having inner and outer surfaces (**17,18**);

first means (**19**) for extruding a liner (**22**) onto the inner surface (**17**) of the reinforcement member (**16**) as the member (**16**) is being pushed from the mandrel (**42**) by the braiding action;

second means (**20**) for extruding a cover (**22**) onto the outer surface (**18**) of the reinforcement member (**116**), said liner (**21**) and cover (**22**) being extruded at approximately the same axial location and adjacent the first end portion (**62**) of the mandrel (**42**); and

means (**23**) for pulling the hose (**10**) after it exits the second extruder means (**26**) at a linear rate faster than the rate of extruding the hose (**10**) so that a predetermined braid

angle is established in the reinforcement member (16) and for holding the hose (10) to maintain the predetermined braid angle for subsequent curing.

4,501,630

METHOD OF SPLICING A MAGNETIC RECORDING TAPE AND A LEADER TAPE

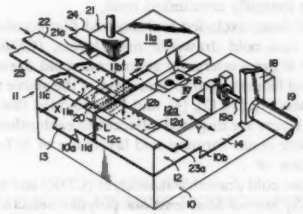
Seiji Kiuchi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 19, 1983, Ser. No. 562,718

Claims priority, application Japan, Dec. 24, 1982, 57-229178

Int. Cl.³ B31F *5/06*; B65H *69/06*

U.S. Cl. 156—159 **4 Claims**



1. A method of splicing a magnetic recording tape and a leader tape comprising the steps of positioning first and second tables to be spaced from each other by a very small distance with their top surfaces being flush with each other, feeding the magnetic recording tape to extend over the top surfaces of the first and second tables across the spaces therebetween, fixing the magnetic recording tape to the top surfaces, inserting a cutter into the space between the tables to cut the recording tape, feeding the leader tape to extend over the top surfaces of the first and second tables across the space therebetween, fixing the leader tape to the top surfaces of the first and second tables, inserting the cutter into the space between the tables, aligning the part of the magnetic recording tape held on one of the tables with the part of the leader tape held on the other table, and applying a splicing tape to the opposed end portions of the part of the magnetic recording tape and the part of the leader tape, wherein the improvement comprises the steps of moving at least one of the tables toward or away from the other table in the longitudinal direction of the tapes along a straight line by a predetermined distance after the tapes are cut and before application of the splicing tape, to adjust the space between the opposed ends of said part of the recording tape and said part of the leader tape to an optimal value.

4,501,631

METHOD FOR PRODUCING UNWOVEN NOVEL ORIENTED PRE-STRESSED WEB

Clarence L. Bostian, Jr., Salisbury, N.C., and Jerome D. Gelula, 535 E. 86 St., New York, N.Y. 10028, assignors to Jerome D. Gelula, New York, N.Y.

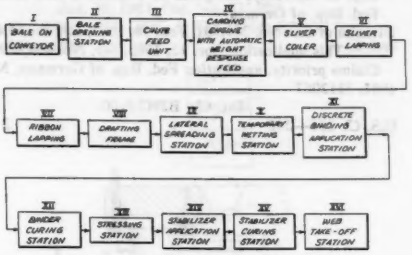
Continuation of Ser. No. 317,042, Nov. 2, 1981, Pat. No. 4,406,724. This application Sep. 13, 1983, Ser. No. 531,874

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.³ B32B *5/08*

U.S. Cl. 156—161 **1 Claim**

1. A method of forming a web of at least a plurality of fibers oriented in at least one predetermined direction, comprising steps which include: conveying a bale of fibers to a bale opening station, opening the bale, feeding the opened fibers to a carding engine, carding said fibers, coiling sliver of said fibers, lapping slivers, causing a plurality of fibers to be oriented in substantially parallel configuration with respect to one another, causing at least some of said oriented fibers to be interconnected with one another at a plurality of portions spaced longitudinally along their respective lengths, causing at least some of said interconnecting portions initially spaced a first distance from one another to be moved such that they are a second and greater distance from one another, and applying stabilizing resin to said interconnecting fiber portions and



facilitating curing of said stabilizing resin prior to release of stress caused by said movement to the greater distance, thereby enhancing the ability of said web to withstand stresses applied thereto.

4,501,632

WRAPPING STEEL PIPES IN A THERMOPLASTIC RIBBON

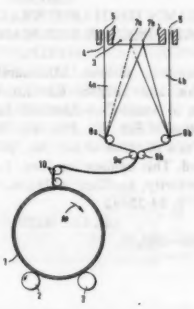
Helmut Landgraf, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,371

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3109216

Int. Cl.³ B29D *23/04*; B32B *31/18, 31/30*

U.S. Cl. 156—187 **9 Claims**



1. A method of enveloping steel pipes in a thermoplastic jacket while such a pipe rotates and advances axially, comprising the steps of:

extruding a thermoplastic hose by means of an extruder having an annular nozzle;

cutting the hose as extruded in two locations to obtain two sheets of semicircular cross section;

flattening each of the sheets;

combining the two sheets with partial overlap to obtain in part a two-ply ribbon with an offset of but one layer along a two-ply portion; and

running the ribbon toward the pipe to obtain a helical wrapping of the ribbon around the pipe on account of its axial and rotational movement.

4,501,633

PROCESS FOR FORMING A DAMPING CONNECTION BETWEEN TWO STRUCTURAL ELEMENTS

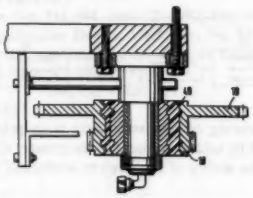
Rudolf Zodrow, and Rainer Buchholz, both of Düsseldorf, Fed. Rep. of Germany, assignors to Jagenberg AG, Düsseldorf, Fed. Rep. of Germany

Division of Ser. No. 349,931, Feb. 18, 1982, Pat. No. 4,450,048. This application Apr. 13, 1983, Ser. No. 484,409

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112067

Int. Cl.³ B29C *5/00*

U.S. Cl. 156—242 **3 Claims**



1. A process for forming a damping connection between two structural elements to be operatively connected, comprising positioning the two elements in the desired relative positions, forming beveled regions on the elements to bound the space between them, temporarily surrounding the space with a collar to form a closed space, casting into said space a material which sets to a resilient solid and undergoes shrinkage when setting, allowing the material to set so that in shrinking the resilient solid in at least one point is drawn against the beveled regions so as to center itself in the manner of a chucking cone, thereby constituting the damping connection, and removing the temporary collar.

4,501,634

COLD DRAWN HIGH-ORIENTATION MULTILAYERED FILM AND PROCESS FOR MANUFACTURE OF SAID FILM

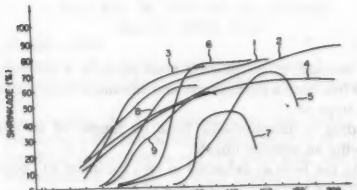
Isao Yoshimura; Osamu Mizukami; Hideo Hata; Junichi Kageyama, and Takashi Kaneko, all of Kanagawa, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 316,101, Oct. 28, 1981, abandoned, which is a division of Ser. No. 103,944, Dec. 14, 1979, abandoned. This application Nov. 1, 1983, Ser. No. 548,018

Claims priority, application Japan, Dec. 18, 1978, 53-154966; Mar. 7, 1979, 54-25642

Int. Cl.³ B32B *27/08*

U.S. Cl. 156—244.24 **32 Claims**



1. A process for manufacturing a multilayered film including at least one layer preponderantly containing a cold-drawable resin selected from the group consisting of blended and unblended specific polymers [1] (B)+(A)+(C), [2] (B)+(A), [3] (B)+(C), [4] (D), and [5] (E),

wherein

(A) is at least one ethylene type polymer selected from the group consisting of copolymers of ethylene with other monomers such as vinyl esters, aliphatic unsaturated carboxylic acids and alkyl esters of said carboxylic acids, ionically crosslinked resins derived from said copolymers and low-density polymers of ethylene

(B) is a soft copolymer elastomer having a Vicat softening point of not more than 60° C.,

(C) is at least one polymer selected from the group consisting of crystalline polypropylene, high-density polyethylene, crystalline polybutene-1 and polymethyl pentene-1,

(D) is a crystalline polybutene-1 having a concentration of 50 to 100% by weight, and

(E) is an ionically crosslinked resin,

said PVDC layer-excluded multilayered film consisting of

at least two cold drawable resin layers, (CDR) each of which is preponderantly at least one cold drawable resin selected from the group consisting of the above mentioned polymers [1], [2], [3], [4], and [5], provided that when the CDR layers are disposed adjacent to each other said cold drawable resins forming said layers are of different compositions; or

at least one cold drawable resin layer (CDR) and at least one layer (S) formed of at least one polymer selected from the group consisting of crystalline polypropylene, polyethylene, ethylene-vinyl acetate copolymer, ethylene-aliphatic unsaturated carboxylic acid copolymers and ethylene-aliphatic unsaturated carboxylic copolymers; or

at least one cold drawable resin layer (CDR), at least one layer selected from the above layer (S), and at least one adhesive layer (AD) formed of at least one member selected from the group consisting of ethylene-vinyl acetate copolymer, ethylene-α-olefin copolymer elastomers, ethylene-aliphatic unsaturated carboxylic acid copolymers and derivatives thereof, and block-copolymerized elastomers of styrene-conjugated diene type monomers;

comprising:

extruding the cold drawable resin into a molten sheet and then quenching said sheet to solidify;

preparing a multilayered raw film having, as at least one of said layers therein, said solidified cold drawable resin sheet; and

cold drawing said multilayered raw film at a temperature between 20° C. and 80° C., provided that the drawing temperature is not exceeding the Vicat softening points of the specific polymers [1], [2], [3], [4] and [5], to yield a drawn film having an area between 3 and 30 times greater than said raw film.

4,501,635

MULTI-LAYER BOARD POSSESSING A VARNISH SURFACE, PROCESS FOR ITS PRODUCTION AND ITS USE

Manfred Siry, Gladbach, and Hans-Dieter Diesel, Seligenstadt, both of Fed. Rep. of Germany, assignors to Letron GmbH, Aschaffenburg, Fed. Rep. of Germany

Continuation of Ser. No. 242,653, Mar. 11, 1981, abandoned. This application Jul. 1, 1983, Ser. No. 510,158

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010060

Int. Cl.³ B05D *3/06*; C09J *5/02*

U.S. Cl. 156—273.3 **24 Claims**

1. Process for the continuous production of a multi-layer board of from 0.3 to 5.0 mm, comprising:

(a) varnishing a finishing layer with a varnish which is hardenable by electron radiation,

(b) hardening in one step said varnish by electron radiation prior to lamination of said finishing layer,

(c) continuously laminating at speeds of from 5 to 35 m/min. by pressing with application of elevated temperatures,

said hardened finishing layer with a carrier layer and a backing layer.

4,501,636

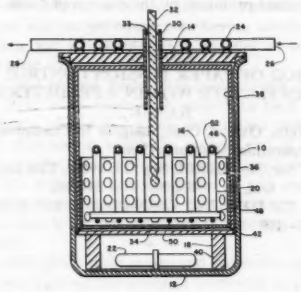
APPARATUS FOR ETCHING VERTICAL JUNCTION SOLAR CELL WAFERS

Charles R. Valley, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,444

Int. Cl.[3] **H01L** *21/306;* **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—345 **1 Claim**



1. An apparatus for etching semiconductor wafers which consists essentially of, in operable association,

a. a cylindrical vessel having a closed bottom and an open tap;

b. a lid for said vessel, said lid having cooling means in association therewith and having means for holding a temperature sensor;

c. a basket assembly adapted for positioning within said cylindrical vessel, said basket assembly having a porous bottom and a porous side and an open top and having handle means in association therewith for lowering said assembly into said vessel and for removing said assembly from said vessel;

d. support means for supporting said basket assembly above the inside bottom of said vessel to provide a free space between the bottom of said vessel and the bottom of said assembly;

e. rack means in association with said basket assembly for holding a plurality of semiconductor wafers for etching; and

f. stirring means.

4,501,637

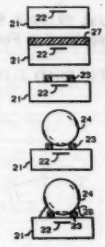
LED HAVING SELF-ALIGNED LENS

Curtis W. Mitchell, Phoenix, and Howard M. Berg, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 272,822, Jun. 12, 1981,. This application Jan. 26, 1984, Ser. No. 573,999

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **B29C** *17/08*

U.S. Cl. 156—630 **3 Claims**



1. A method for assembling a lens and a semiconductor device having a light emitting area comprising the steps of:

applying a layer of polymeric material to said semiconductor device;

patterning said layer to form an aperture at least as large as said area and in approximate registration with said area;

depositing adhesive on said layer;

contacting said adhesive with said lens whereby surface tension forces cause a self-centering of the lens over said area; and

causing said adhesive to gel, thereby locking said lens in position over said area.

4,501,638

LIQUID CHEMICAL PROCESS FOR FORMING CONDUCTIVE THROUGH-HOLES THROUGH A DIELECTRIC LAYER

Daniel D. Johnson, Yorklyn, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1983, Ser. No. 558,308

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00;* **B29C** *17/08*

U.S. Cl. 156—644 **13 Claims**

1. A process for making an electrically conducting path in a dielectric layer sandwiched between two conductive layers comprising

(a) forming a hole completely through one of the conductive layers without substantially removing material from the dielectric layer;

(b) through said hole etching the dielectric layer using a liquid capable of etching said dielectric layer whereby a pathway is formed completely through the dielectric layer between the conductive layers and whereby the conductive layer is undercut of dielectric material adjacent to the hole in said conductive layer;

(c) deforming the conductive layer which has been undercut toward the other conductive layer, and

(d) forming an electrical conducting path between the two conductive layers through the pathway.

4,501,639
PROCESS AND DEVICE FOR MAKING ALKALI METAL PHOSPHATES BY SPRAYING ALKALI METAL PHOSPHATE SOLUTIONS OR SUSPENSIONS

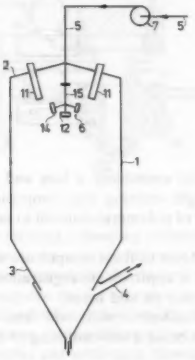
Ben Damman, Middelburg; Jan Drijver, Vlissingen; Hans Kinneging, Middelburg; Hans Scheffer; Jaap Stam, both of Vlissingen, and Paul de Witte, Westkapelle, all of Netherlands, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,769

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129180

Int. Cl.³ B01D *1/18*; C01B *25/30*

U.S. Cl. 159—48.1 **1 Claim**



1. In a process for making alkali metal phosphates or alkali metal polyphosphates from feed materials selected from solutions and suspensions of alkali metal phosphates by introducing the feed materials in the upper portion of a spray tower, spraying them inside said spray tower through a flame zone produced by a plurality of burners arranged in annular fashion and collecting the dried alkali metal phosphates or metal polyphosphates, the improvement which comprises putting the feed materials under a pressure of 10 to 66 bars by means of at least one pressure-increasing pump; and spraying the feed materials by forcing them under said pressure in the absence of highly pressurized gases through a plurality of single opening nozzles, said single opening nozzles having bores 0.5 up to 5 mm wide disposed in their terminal surface areas.

4,501,640
CREPING ADHESIVES CONTAINING POLYVINYL ALCOHOL AND CATIONIC POLYAMIDE RESINS

Dave A. Soerens, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 18, 1983, Ser. No. 542,918

Int. Cl.³ D21H *5/24*

U.S. Cl. 162—111 **7 Claims**

1. A method for creping cellulosic webs comprising:

(a) applying to a rotating creping cylinder an aqueous admixture containing from about 96 to about 99.9 weight percent water and from about 4 to about 0.1 weight percent solids, wherein from about 30 to about 90 weight percent of said solids is water-soluble polyvinyl alcohol having a weight average molecular weight of from about 90,000 to about 140,000 and a degree of hydrolysis of from about 80 to about 90 percent and wherein from about 10 to about 70 weight percent of said solids is a water-soluble, thermosetting, cationic polyamide resin which is phase-compatible with the polyvinyl alcohol, said cationic polyamide resin comprising the water-soluble reaction product of an epihalohydrin and a polyamide containing secondary amine groups, the ratio of epihalohydrin to secondary amine groups of said polyamide being from about 0.5 to 1 to about 1.8 to 1, said polyamide being obtained by heating together at a temperature of from about 110° C. to about 250° C. a C_3–C_{10} saturated aliphatic dibasic carboxylic acid and a polyalkylene polyamine in a mole ratio of polyalkylene polyamine to dibasic acid of from about 0.8 to 1 to about 1.4 to 1;

(b) pressing a cellulosic web against the creping cylinder to effect adhesion of the web to the surface of the cylinder; and

(c) dislodging the web from the creping cylinder by contact with a doctor blade.

4,501,641
PROCESS FOR PRODUCING PAPER OR NON-WOVEN FABRIC

Tadashi Hirakawa, Kusatsu, and Makoto Yoshida, Ibaraki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 30, 1982, Ser. No. 403,544

Claims priority, application Japan, Feb. 18, 1981, 56-21378; Apr. 2, 1981, 56-48381

Int. Cl.³ D21H *3/60*

U.S. Cl. 162—164.3 **4 Claims**

1. A process for producing paper or wet non-woven fabric comprising mixing an aqueous anionic polymer solution with an aqueous cationic polymer solution to form a mixture containing solid aggregate of the two polymers, and wherein the anionic polymer is a copolyester containing polyethylene glycol as the diol component and isosphthalic acid and an aromatic dicarboxylic acid having a sodiosulfo group bound to the aromatic nucleus as the dicarboxylic acid component, adding the mixture to a slurry of fiber or pulp, converting the slurry into paper or non-woven fabric by a wet papermaking technique, and drying the paper or non-woven fabric.

4. The product produced by the process of claim 1.

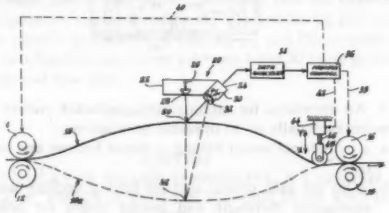
4,501,642
METHOD OF PAPER TENSION CONTROL TO MAINTAIN FLUTTER WITHIN A PREDETERMINED RANGE

Henry A. Wells, Oxford, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 422,001, Sep. 23, 1982,. This application Oct. 31, 1983, Ser. No. 546,993

Int. Cl.³ D21F *7/00*; G01N *21/86*; G01V *9/04*

U.S. Cl. 162—198 **3 Claims**



1. A method for controlling paper tension in a paper manufacturing apparatus comprising the steps of:

driving a paper web across a paper path in said paper manufacturing apparatus;

projecting an energy beam onto a surface of the web along a line which is substantially perpendicular to the web which energy beam is reflected by the web;

detecting the energy beam reflected by the web with a noncontacting sensor to provide an indication of the spatial position of the web and enable measurement of the frequency and amplitude of flutter in said driven paper web; and

adjusting the tension in said paper web in response to variations in the spatial position of the web, to maintain said

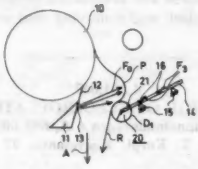
flutter within a predetermined range of frequency and amplitude.

4,501,643

APPARATUS FOR CUTTING AND GUIDING THE MARGINAL LEAD-IN STRIP OF PAPER WEB

Rainer Kiuru, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Filed May 13, 1982, Ser. No. 378,018
Claims priority, application Finland, May 15, 1981, 811513
Int. Cl.³ D21F *1/36, 2/00*
U.S. Cl. 162—286 **15 Claims**



1. Apparatus for cutting and guiding a marginal lead-in strip which has been separated from a paper web in connection with a paper web lead-in operation on a paper machine, comprising:

first guide plate means with which a first nozzle tube is associated adapted to be connected to a source of pressurized gas, said first nozzle tube having nozzle means formed therein for directing gas jets substantially parallel to said first guide plate means;

second guide plate means with which a second nozzle tube is associated adapted to be connected to a source of pressurized gas, said second nozzle tube having nozzle means for directing gas jets substantially parallel to said second guide plate means;

said first and second guide plate means being attached to each other at an angle with respect to each other, the orientation of said first guide plate means corresponding to the direction in which the severed end of the lead-in strip is conducted after the lead-in strip has been separated from the web, and the orientation of said second guide plate means corresponding to the direction in which the lead-in strip is further conducted to a section of the paper machine;

wherein said guide plate means and respective nozzle tubes and nozzle means are arranged to operate as guiding and transporting surfaces so that gas jets directed from respective ones of said nozzle means of said first and second guide plate means pull the lead-in strip in respective opposed directions in the region of said guide plate means, whereupon the lead-in strip is severed by rupture in a region between said guide plate means or in a region between said nozzle means;

wherein said first guide plate means is arranged so that the new end of the lead-in strip obtained by the severing of the marginal strip is conducted therealong;

wherein said respective nozzle tubes associated with said first and second guide plate means are formed with respective outer sides and respective sides adjacent to said outer sides which are in mutually substantially opposed relationship to each other;

wherein each of said first and second guide plate means is affixed to an opposed side of a respective nozzle tube at a location which is spaced from the respective outer side thereof; and

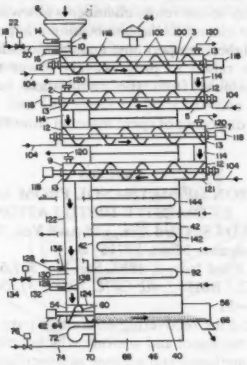
wherein said nozzle means are formed in each of said respective nozzle tubes in said opposed side thereof in the space between said guide plate means and said outer side thereof.

4,501,644

APPARATUS FOR THE SELECTIVE RETORTING OF CARBONACEOUS MATERIALS

Delbert D. Thomas, 1522 Cameo Dr., Redlands, Calif. 92373

Filed Sep. 28, 1982, Ser. No. 425,424
Int. Cl.³ C10B *7/10, 27/00, 49/06, 51/00*
U.S. Cl. 202—99 **7 Claims**



1. A staged retort for removing liquid and/or gaseous products from carbonaceous solids and/or semisolids such as oil shale comprising:

a plurality of retort chambers in which the carbonaceous solids and/or semisolids are heated, each said chamber including enclosing walls separating the interior of each said retort chamber from the exterior thereof;

means for heating each retort chamber to a different temperature;

said plurality of retort chambers including a first retort chamber into which the carbonaceous solids and/or semisolids are first introduced into the staged retort;

means for introducing the carbonaceous solids and/or semisolids into the first retort chamber;

means for limiting escape of the liquid and/or gaseous products from the first retort chamber as carbonaceous solids and/or semisolids are introduced therein;

means for transporting the carbonaceous solids and/or semisolids from a retort chamber of a given temperature to a retort chamber of a higher temperature;

means for separately withdrawing the liquid and/or gaseous products formed by pyrolysis in each retort chamber;

the plurality of retort chambers including a last retort chamber in which the carbonaceous solids and/or semisolids are pyrolyzed for the last time;

second means for limiting escape of the liquid and/or gaseous products from the last retort chamber as spent carbonaceous materials are removed therefrom;

means for burning the carbonaceous materials from the last retort chamber to produce heat for heating the retort chambers;

means for raising the temperature of a gas;

means for recycling a predetermined portion of the gaseous products of pyrolysis from one or more retort chambers into the means for raising gas temperature to obtain a heated gas;

means for controlling the temperature of the recycled gas;

means for monitoring the temperatures of each of the retort chamber interiors so that the required temperature of the controlled temperature gas can be determined to correctly influence each chamber interior to a predetermined temperature;

means for injecting the controlled temperature gas into one or more retort chamber interiors to influence the tempera-

ture therein, so that each retort chamber interior is maintained at its individual predetermined temperature;

said retort chambers disposed in a modular arrangement one above the other;

a combustion compartment enclosing the means for burning located below the lowest retort chamber in which heated flue gases are produced;

means for circulating the heated flue gases upward in close proximity to the retort chamber walls whereby the retort chamber closest to the combustion compartment is raised to the highest temperature, and the ascending retort chambers are raised to progressively lower temperatures as their distance from the combustion compartment increases; and

means for disposing of spent material from the staged retort.

4,501,645
SEPARATION OF METHANOL FROM ACETONE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Filed Nov. 1, 1983, Ser. No. 547,654
Int. Cl.³ B01D *3/40*; **C07C** *29/84, 31/04, 49/08*
U.S. Cl. 203—51 **9 Claims**

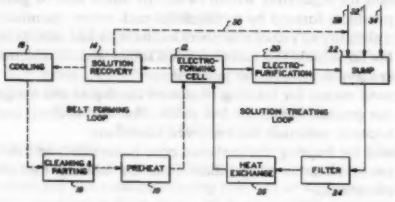
1. A method for recovering essentially pure methanol from a mixture of methanol and acetone which comprises distilling a mixture of methanol and acetone in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure methanol as overhead and obtaining the extractive agent plus acetone from the stillpot or reboiler, the extractive agent is one or more aliphatic ketones containing from four to eleven carbon atoms.

3. A method for recovering essentially pure methanol from a mixture of methanol and acetone which comprises distilling a mixture of methanol and acetone in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure methanol as overhead and obtaining the extractive agent plus acetone from the stillpot or reboiler, the extractive agent is one or more aromatic ketones containing from eight to fourteen carbon atoms.

4,501,646
ELECTROFORMING PROCESS

William G. Herbert, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,164
Int. Cl.³ C25D *1/00, 1/02*
U.S. Cl. 204—4 **15 Claims**

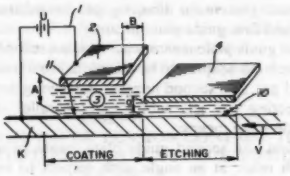


1. An electroforming process comprising providing a core mandrel having an electrically conductive, abhesive outer surface, a coefficient of expansion of at least about 8×10^{-5} in./in./°F., a segmental cross-sectional area of less than about 1.8 square inches and an overall length to segmental cross-sectional area ratio greater than about 0.6, establishing an electroforming zone between an anode selected from a metal and alloys thereof having a coeficient of expansion of between about 6×10^{-6} in./in./°F. and about 10×10^{-6} in./in./°F. and a cathode comprising said core mandrel, said cathode and said anode being separated by a bath comprising a salt solution of said metal, heating said bath and said cathode to a temperature sufficient to expand the cross-sectional area of said mandrel, applying a ramp current across said cathode and said anode to electroform a coating of said metal on said core mandrel, said coating having a thickness at least about 30 Angstroms and stress-strain hysteresis of at least about 0.00015 in./in., rapidly applying a cooling fluid to the exposed surface of said coating to cool said coating prior to any significant cooling and contracting of said core mandrel whereby a stress of between about 40,000 p.s.i. and about 80,000 p.s.i. are imparted to the cooled coating to permanently deform said coating and to render the length of the inner perimeter of said coating incapable of contracting to less than 0.04 percent greater than the length of the outer perimeter of said core mandrel after said core mandrel is cooled and contracted, cooling and contracting said core mandrel, and removing said coating from said core mandrel.

4,501,647
METHOD OF ELECTROPLATING

Jouko K. Korpi, Jannelundsvägen 6 A, 693 00 Degerfors, Sweden, and Teuvo T. Korpi, Kaavelantie 97 A, Helsingfors, Finland

PCT No. PCT/SE83/00016, § 371 Date Oct. 7, 1983, § 102(e) Date Oct. 7, 1983, PCT Pub. No. WO83/02786, PCT Pub. Date Aug. 18, 1983
PCT Filed Jan. 21, 1983, Ser. No. 551,978
Claims priority, application Sweden, Feb. 9, 1982, 8200728
Int. Cl.³ C25D *5/34*
U.S. Cl. 204—23 **11 Claims**



1. In a method for electroplating metal onto a workpiece which is connected as a cathode in a current circuit, wherein said workpiece is moved through an electrolyte bath past at least one anode which is arranged generally parallel to the direction of movement of the workpiece, the improvement comprising:

prior to moving said workpiece past at least one anode, moving the workpiece past a member in said bath arranged generally parallel to the direction of movement of the workpiece and which member is generally closer to said workpiece than said anode, whereby said member controls the current density between said member and said workpiece, causing said workpiece to be etched as it passes said member.

4,501,648
ELECTROPHORETIC PROCESS FOR SEPARATING AQUEOUS MINERAL SUSPENSIONS

Robert A. Ritter, Calgary, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Continuation of Ser. No. 330,162, Dec. 14, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 476,820
Claims priority, application Canada, May 26, 1981, 378386
Int. Cl.³ C02F *1/46*
U.S. Cl. 204—149 **7 Claims**

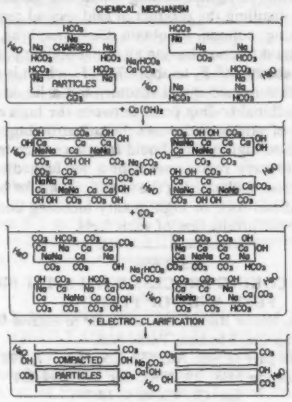
1. A process for separating an aqueous suspension of fine mineral solids into a solids product and a clarified liquid product, comprising:

chemically treating the suspension by adding lime in an amount between 0.5 and 3.5 g/l of suspension;

adding to the suspension a reagent, selected from the group consisting of carbon dioxide, ammonium carbonate, ammonium bicarbonate and mixtures thereof, in an amount sufficient to maintain the pH of the suspension during electrical treatment in the range of about 8.4 to 11 units;

moving an anode electrode into, through and out of the suspension in spaced, generally parallel relation to a cathode electrode submerged in the suspension;

applying sufficient electrical potential between the electrodes and retaining the anode electrode for at least sufficient time in the suspension to cause the solids to migrate to and deposit on the anode electrode and to dry thereon to a solids content greater than about 40% by weight;



removing from the suspension that portion of the anode electrode which has been in the suspension at least the required minimum time, together with the solids associated therewith, and recovering the solids therefrom;

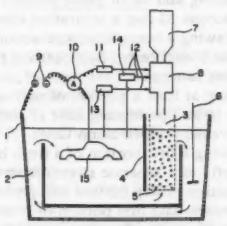
and recovering clarified liquid product, containing less than about 4% by wt. solids.

4,501,649

METHOD OF CONTROLLING ELECTROCOATING BATH AND APPARATUS THEREFOR

Nobuo Furuno, Amagasaki; Yoshio Ota, Tsuzuki; Masahiro Itai, Osaka; Akio Tokuyama, and Eiichi Nakano, both of Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Nov. 2, 1983, Ser. No. 548,139
Claims priority, application Japan, Nov. 6, 1982, 57-195151
Int. Cl.³ C25D *13/24*
U.S. Cl. 204—181 R **9 Claims**



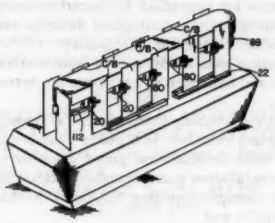
1. A method of controlling the composition of an electrocoating bath which comprises removing excess counter-ion in the electrocoating bath by means of an ion exchange resin, wherein the ion exchange resin, contained in a porous container equipped in an electrocoating system, is suspended in the electrocoating bath at an ion exchange capacity of not more than the chemical equivalent of the excess counter-ion to be removed, said porous container permitting passage of the electrocoating bath therethrough to provide direct contact between the electrocoating bath and the ion exchange resin.

4,501,650

WORKPIECE CLAMP ASSEMBLY FOR ELECTROLYTIC PLATING MACHINE

Leonard C. Maron, Bristol, Conn., assignor to Napco, Inc., Terryville, Conn.

Filed Aug. 26, 1983, Ser. No. 526,981
Int. Cl.³ C25D *17/06, 17/04*
U.S. Cl. 204—198 **12 Claims**



1. A plating machine having an electrolytic solution and electrode means for plating marginal lower edge portions of flat planar workpieces comprising:

a machine frame including a base having various rinsing and plating stations, including an elongated superstructure spaced above said base,

a workpiece transport conveyor having a chain and at least two sprockets supported in opposite ends of said superstructure for rotation on vertical axes so that said chain moves in a closed path defined by generally parallel straight runs and generally semi-circular end turns,

elongated tracks supported in said superstructure adjacent and parallel said straight chain runs,

a plurality of workpiece clamp assemblies slidably received on said tracks, and each assembly having a clamping portion and a base portion,

said chain having individual roller links connected to one another by conventional means, and having rollers supported on vertically extending pins, at least some of said pins having projecting portions which are received in pin openings provided in said clamp assembly base portions to connect said clamp assembly base portions to said chain at spaced locations thereon, and

clamp assembly support means located at the ends of said superstructure, at least one such support means being movable from an active position to support said clamp assemblies as they move around a sprocket to an inactive position such that said clamp assemblies can be removed or replaced to vary the spacing of said clamp assemblies on said chain.

4,501,651

PROCESS FOR TREATING OIL SHALE WITH A MILD OXIDANT

Costandi A. Audeh, 694 Prospect Ave., Princeton, N.J. 08540, and Joseph J. Dickert, Jr., 17 S. Homestead Dr., Yardley, Pa. 19067

Filed May 2, 1983, Ser. No. 490,904
Int. Cl.³ C10G *1/00;* **C10B** *53/06*
U.S. Cl. 208—11 R **12 Claims**

1. A process for substantially reducing hydrogen sulfide formation during retorting of oil shale which additionally contains pyrites, comprising the steps of:

(a) treating the oil shale under mild oxidative conditions

with sufficient oxidant in an aqueous medium to reduce hydrogen sulfide formation; and

(b) retorting the treated shale to recover therefrom hydrocarbon fluids, gases, or mixtures thereof.

4,501,652
PROCESS FOR SELECTIVE REMOVAL OF CCR, ARSENIC AND CONJUGATED DIOLEFINS FROM SHALE OIL

Quang N. Le, Westville, and Daniel J. Neuman, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1983, Ser. No. 544,021
Int. Cl.³ C10G *65/06, 67/06*
U.S. Cl. 208—57 **7 Claims**

1. A process for upgrading hydrocarbonaceous fluids said fluids containing arsenic, conjugated diolefins and Conradson Carbon Residue, comprising in sequence:

(a) contacting said fluids with a hydrocarbon upgrading catalyst and hydrogen at a temperature between 300° and 800° F.;

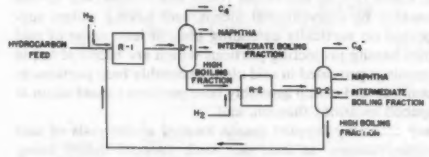
(b) passing the resulting fluids of step (a) through a demetallation guard chamber, said guard chamber comprising a bed of fresh demetallaton guard chamber catalyst, said fresh demetallation guard chamber catalyst being selected from the group comprising Ni/Al_2O_3, $NiMo/Al_2O_3$, and NiW/Al_2O_3; and

(c) passing the resulting fluids of step (b) through a hydroprocessing chamber under conditions which deposit said arsenic on a bed of fresh hydroprocessing catalyst, said fresh hydroprocessing catalyst being selected from the group comprising $NiMo/Al_2O_3$ and NiW/Al_2O_3, wherein said hydrocarbon upgrading catalyst is the deactivated catalyst of either of said demetallation guard chamber or said hydroprocessing chamber.

4,501,653
PRODUCTION OF JET AND DIESEL FUELS

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 22, 1983, Ser. No. 516,446
Int. Cl.³ C10G *65/12*
U.S. Cl. 208—89 **15 Claims**



1. A process for the production in a multi-reactor unit of jet fuels, diesel fuels, multi-purpose fuels meeting the critical property requirements of jet fuels and diesel fuels, and high quality blending components useful for the production of such fuels, which comprises

feeding, with hydrogen, into the initial reactor of the multi-reactor unit, a sulfur and nitrogen-containing hydrocarbon feed having an initial boiling point ranging from about 100° F. to about 250° F., and a high end point boiling within the range of from about 600° F. to about 750° F., passing said feed over a catalyst having a Group VI-B or Group VIII-B metal, or admixture of such metals, dispersed upon an inorganic oxide support at conditions sufficient to hydrodesulfurize and hydrodenitrogenate said feed,

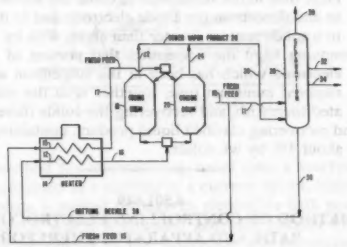
distilling said hydrodesulfurized, hydrodenitrogenated fraction to obtain C_4-, naphtha, a high boiling liquid fraction having an initial boiling point of from about 420° F. to about 470° F., and a fraction of boiling range intermediate that of said naphtha and said high boiling liquid fraction.

feeding said high boiling product liquid fraction, with hydrogen, into a second reactor of the multi-reactor unit and hydroselectively cracking said fraction over a cracking catalyst constituted of a Group VI-B or Group VIII metal, or admixture thereof, dispersed on a zeolite support of pore size ranging up to about 6 Å at conditions sufficient to eliminate normal paraffins and convert said normal paraffins to lighter boiling liquid and gaseous products, and distilling the product of said second reactor in a fractionating column to obtain C_4-, naphtha, a high boiling liquid fraction having an initial boiling point ranging from about 600° F. to about 700° F. which is recycled to extinction in said initial reactor, and a liquid fraction having an initial boiling point between the high end boiling point of said naphtha and the initial boiling point of said recycled high boiling liquid fraction which meets the critical property requirements of a jet fuel, diesel fuel, multi-purpose fuel meeting the specifications for both a jet fuel and diesel fuel, or high quality blending component useful for the production of such fuels.

4,501,654
DELAYED COKING PROCESS WITH SPLIT FRESH FEED AND TOP FEEDING

David E. Allan, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 552,625, Nov. 17, 1983,. This application Mar. 29, 1984, Ser. No. 594,851
Int. Cl.³ C10G *9/14*
U.S. Cl. 208—92 **10 Claims**



1. In a delayed coking process which comprises the steps of:

(a) preheating a hydrocarbonaceous oil chargestock to a coking temperature in a preheating zone;

(b) introducing the resulting preheated oil chargestock into a coking zone at delayed coking condition to form coke and a vapor phase product, including heavy and light hydrocarbon products;

(c) introducing said vapor phase product and a fresh hydrocarbonaceous oil into a separation zone;

(d) withdrawing a heavy bottoms fraction, including at least a portion of said heavy hydrocarbon products, from said separation zone, and

(e) recycling at least a portion of said withdrawn bottoms fraction to said preheating zone of step (a),

the improvement which comprises:

(f) introducing a first portion of a fresh hydrocarbonaceous oil directly as a separate stream from said recycled bottoms fraction of step (e) into said preheating zone of step (a) to preheat said first portion of fresh oil;

(g) introducing a second portion of said fresh hydrocarbonaceous oil into said separation zone of step (c);

(h) introducing said preheated first portion of fresh feed into an upper portion of said coking zone, and

(i) introducing at least a portion of the preheated recycled bottoms fraction resulting from step (e) into a bottom portion of said coking zone.

4,501,655

HYDROCRACKING PROCESS

Lee Hilfman, and Mark J. O'Hara, both of Mount Prospect, Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 526,235, Aug. 25, 1983, Pat. No. 4,464,481.
This application Mar. 30, 1984, Ser. No. 595,113
Int. Cl.[3] C10G 47/04, 47/20
U.S. Cl. 208—110 4 Claims

1. A process for the hydrocracking of a hydrocarbon charge stock which comprises reacting the charge stock with hydrogen at hydrocarbon hydrocracking conversion conditions wherein said hydrocarbon hydrocracking conversion conditions include a temperature from about 500° F. to about 1000° F., a pressure from about 500 to about 3000 psig, a liquid hourly space velocity from about 0.2 to about 15 and a hydrogen circulation rate from about 500 to about 20,000 standard cubic feet per barrel of hydrocarbon charge and in contact with a catalytic composite comprising a silica-thoria carrier material wherein said carrier is cogelled silica-thoria containing from about 25% to about 99% by weight silica and from about 1% to about 75% by weight thoria and on an elemental basis about 0.5 to 14 wt. % Group VIB metal component, about 0.5 to 2 wt. % Group VIII metal component, and 1.0 to 3.0 wt. % of a fluorine component.

4,501,656

DEWAXING PROCESS EMPLOYING A CATALYST WITH A HIGHLY DEALUMINATED MORDENITE BASE

Pierre Dufresne; Edouard Freund, both of Rueil Malmaison; Christian Marcilly, Houilles, and Francis Raatz, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 23, 1983, Ser. No. 507,415
Claims priority, application France, Jun. 23, 1982, 82 11132
Int. Cl.[3] C10G 45/12, 45/64, 47/20
U.S. Cl. 208—111 7 Claims

1. A method for improving the low temperature properties and desulfurizing an oil cut having an initial boiling point of 180°–320° C. and a final boiling point of 320°–420° C., a sulfur content of 0.5–3.5% by weight and a pour point and cloud point higher than 0° C., said method comprising the step of contacting said cut with hydrogen, in the presence of a catalyst comprising:

(1) an acidic carrier comprising:
   (a) at least 50% by weight, calculated as dry carrier, of highly dealuminated zeolitic mordenite having a molar SiO_2/Al_2O_3 ratio greater than or equal to 110 and a sodium content of not more than 0.5% by weight; and
   (b) an amorphous matrix; and
(2) at least one Group VIII metal oxide, and at least one Group VI metal oxide;

at a pressure of 1.0–10.0 megapascals, a temperature of 300°–460° C., a space velocity of 0.2–3 VVH, and a volumic ratio H_2/oil of 200–1500; whereby the pour point and cloud point of the resultant oil are lowered by at least 10° C., and at least 90% desulfurization is achieved.

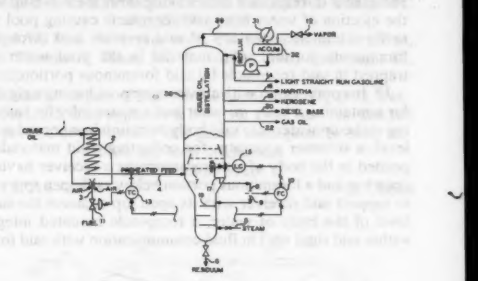
4,501,657

PREHEATING OF DISTILLATION FEED

Milton H. Nollkamper, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 1, 1983, Ser. No. 462,850
Int. Cl.[3] B01D 3/42; C10G 7/12
U.S. Cl. 208—350 41 Claims

1. Apparatus comprising:
   (a) a preheating means for heating feed;
   (b) a distillation column;
   (c) a feed means for introducing feed heated by said preheating means into said distillation column;
   (d) a liquid condensate collection means positioned above said feed means of said distillation column, for collecting liquid produced by the condensation of vapor in said distillation column;
   (e) a means for measuring the amount of liquid in said liquid condensate collection means; and
   (f) a means to control the extent to which feed is heated by



said preheating means in response to the amount of liquid in said liquid condensate collection means.

4,501,658

METHOD OF CONDITIONING CLAY FOR FLOTATION USING IN SITU FERROUS ACTIVATOR

Raymond H. Young, Macon, Ga., assignor to Freeport Kaolin Company, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,250
Int. Cl.[3] B03B 1/00
U.S. Cl. 209—5 17 Claims

1. A method of treating a clay containing titanium mineral impurities and reducible iron impurities to remove said impurities therefrom, said method comprising the steps of:
   (a) mixing said clay in the form of an aqueous slurry having a solids content of clay of at least 25% by weight with a reducing agent which functions to reduce said reducible iron impurities to a water-soluble ferrous salt and which thereafter reduces said reducible iron impurities to a water-soluble ferrous salt which is an in situ activator for said titanium mineral impurities;
   (b) conditioning a mixture of said aqueous clay slurry containing said water-soluble ferrous salt in situ activator and said titanium mineral impurities, a collector for the titanium mineral impurities in said clay, and sufficient activator for said titanium mineral impurities including said in situ activator at a pH below 7 and at a solids content of at least 25% by weight for a time sufficient to dissipate therein at least 25 horsepower hours of energy per ton of solids;
   (c) subjecting the conditioned mixture to an air froth flotation process by passing air bubbles upwardly through the conditioned aqueous slurry and removing titanium impurities with the froth; and
   (d) recovering clay having a reduced titanium minerals impurities content.

4,501,659

SKIMMER APPARATUS FOR SWIMMING POOLS

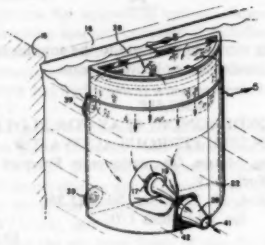
Charles R. Henk, 581 Princeton Ave., Brick Town, N.J. 08723

Filed Dec. 7, 1982, Ser. No. 447,512
Int. Cl.[3] E04H 3/16
U.S. Cl. 210—169 14 Claims

1. For a swimming pool having a body of water and a water inlet for introducing make-up water into said body to maintain a normal surface level, a skimmer apparatus for collecting solid materials suspended in said body comprising a receiver having an open top and a foraminous portion below said open top, means to support said receiver with its open top adjacent the surface level of the body of water, a receptacle in fluid communication with said foraminous portion of said receiver, means defining a discharge opening in said receptacle for directing water from said receptacle into the body of water, and nozzle means adapted to be connected to said water inlet and positioned in registry with said discharge opening to direct a stream of the make-up water from the inlet through said discharge opening, said opening being sufficiently larger than said

nozzle stream to cause said nozzle to eject water from said receptacle through said outlet along with the make-up water, the ejection of water from said receptacle causing pool water to flow into the open top of said receiver and through the foraminous portion, solid material in the pool water being trapped in said receptacle by said foraminous portion.

13. In combination with a swimming pool having a rigid wall for containing a body of water and a water inlet for introducing make-up water into said body to maintain a normal surface level, a skimmer apparatus for collecting solid materials suspended in the body of water comprising a receiver having an open top and a foraminous portion below said open top, means to support said receiver with its open top adjacent the surface level of the body of water, a receptacle mounted integrally within said rigid wall in fluid communication with said foraminous portion of said receiver, means defining a discharge opening in said receptacle for directing water from said receptacle into said body, said make-up water inlet being positioned within said receptacle to introduce make-up water into the body of water through said receptacle and said discharge opening, and nozzle means connected to said water inlet and positioned in registry with said discharge opening to direct a stream of make-up water from said inlet through said discharge opening, said opening being sufficiently larger than said nozzle stream to cause said nozzle to eject water from said receptacle through said outlet along with the make-up water, the ejection of water from said receptacle causing pool water to flow into the open top of said receiver and through the foraminous portion, solid material in the pool water being trapped in said receptacle by said foraminous portion.



4,501,660

OIL FILTER

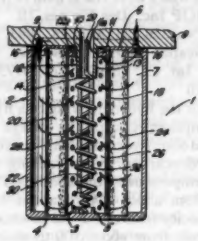
Alfred Hebert, Skidmore Rd., Pleasant Valley, N.Y. 12569

Continuation-in-part of Ser. No. 469,787, Feb. 25, 1983, , which is a continuation of Ser. No. 274,395, Jun. 17, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,804

Int. Cl.[3] **B01D** *27/06, 35/06*

U.S. Cl. 210—209 **2 Claims**

1. An oil filter device comprising an outer cylindrical container member having inner and outer ends, the outer end of said member being closed, said inner end having a central annular outlet aperture with internally threaded walls adapted to engage exteriorly threaded walls of an annular conduit extending from an engine block, the outer regions of said inner end having inlet apertures formed therein, a cylindrical perforated shell centrally located within said outer member and defining a filtering regions between the cylindrical walls of the outer container and said shell, an accordian-shaped filter element located in said filtering region, and within the perforated shell a core region, said core region adapted to contain a permanently magnetized metal helical structure within which structure is retained at least one bar of magnesium metal, the inner terminus of said helical structure extending into said central outlet aperture, central windings of said helical structure having a radius less than the radius of said central outlet aperture and greater than the radius of the said annular conduit, whereby oil flowing inwardly through said filtering element flows past said helical structure and magnesium bar, and metallic particles in said oil are removed by said magnetized helix, and acid carried by said oil is neutralized by said magnesium metal, and said oil flows out of said oil filter device through said central outlet aperture.



4,501,661

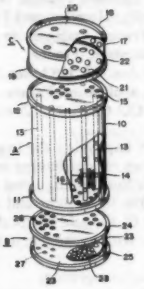
METHOD AND APPARATUS FOR PURIFICATION AND ACTIVATION OF WATER

Masafusa Karasawa, 783-2, Ohaza-Karasugawa, Horiganemura, Minami-azumi-gun, Nagano Prefecture, Japan

Filed Apr. 3, 1984, Ser. No. 596,087

Int. Cl.[3] **B01D** *35/06;* **B03C** *1/02;* **C02F** *1/48*

U.S. Cl. 210—223 **2 Claims**



1. An apparatus for purification and activation of water which comprises dechloration zone charged with an agent having an ability to decompose combined chlorine to free chlorine and to adsorb free chlorine, activation zone to disorder the equilibrium state of water and ionize the thus disordered water wherein particles of magnetic multielementary mineral and one or more magnet bars containing magnets in a midair space are installed among said particles and settlement zone charged with a means to disturb the ionic balance of water and to make the water oriented to be softened.

4,501,662

WIRE MACHINE, FOR DEWATERING STOCK SUSPENSIONS

Mario Biondetti, Schio, Italy, assignor to Escher Wyss GmbH, Ravensburg/Württ., Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,940

Claims priority, application Switzerland, Jun. 3, 1981, 3617/81

Int. Cl.[3] **D21C** *9/12;* **D21F** *1/78, 1/80*

U.S. Cl. 210—391 **9 Claims**

1. A wire machine for dewatering stock suspensions, comprising:

at least two dewatering cylinders;

an endless revolving wire defining an endless wire loop;

said at least two dewatering cylinders being located within said endless wire loop;

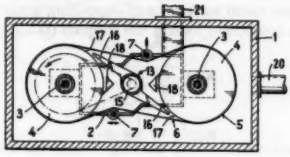
said dewatering cylinders and said wire coacting with one

another so as to form therebetween substantially wedge-shaped spaces;

at least one infeed device located within said wire loop for infeeding a respective substantially flat stock jet of the material which is to be dewatered into each of said substantially wedge-shaped spaces between said wire and said dewatering cylinders;

at least one removal device operatively associated and cooperating with each dewatering cylinder and serving for the removal of dewatered material adhering to the surface of the associated dewatering cylinder;

each said dewatering cylinder having a lengthwise axis which is substantially vertically arranged;



said wire having a wire surface which is likewise substantially vertically arranged;

the dewatered material removed by said removal devices being removed under the action of the force of gravity downwardly out of the region of the wire and said dewatering cylinders; and

said wire defining a common wire training about said two dewatering cylinders and forming said endless wire loop.

4,501,663

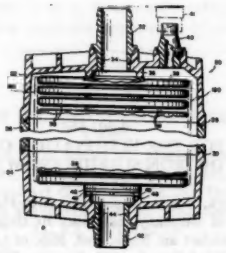
FILTER CARTRIDGES AND METHODS AND COMPONENTS FOR MAKING THEM

Wayne S. Merrill, Litchfield, N.H., assignor to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 091,626, Nov. 5, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,420

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—347 **18 Claims**



1. The method of bonding a preformed filter to a support surface which comprises: adding a predetermined amount of solvent to the pores of the filter, said solvent being a solvent for the support surface but not the filter; contacting the support surface with the solvent containing filter, the contacting surface of the support comprising a plurality of ribs, the area between said ribs not in contact with the filter forming channels for the flow of liquid; maintaining contact with said ribs until said solvent solvates said rib and wicks a portion thereof into the contacting pores of said filter; and removing the solvent.

4,501,664

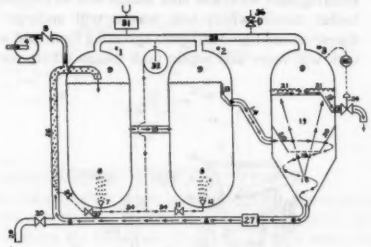
METHOD AND APPARATUS FOR TREATING ORGANIC WASTEWATER

Richard W. Heil, 30 Arthur Ave., Clarendon Hills, Ill. 60514, and Thomas A. Rose, 351 S. Waiola Ave., LaGrange, Ill. 60525

Continuation-in-part of Ser. No. 359,585, Mar. 18, 1982, Pat. No. 4,415,452. This application Nov. 10, 1983, Ser. No. 550,906 The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—614 **11 Claims**



1. The method of treating organic waste liquid with activated sludge comprising the steps of:

establishing an enclosed continuous flow way for the organic waste liquid and the activated sludge in a mixed liquor form including several aeration chambers, and a separator chamber that are air pressurized to a predetermined pressure, that contain organic waste liquid and activated sludge, and that are consecutively connected in a continuous flow circuit through said aeration chambers, said separator chamber, and return flow to said one aeration chamber,

mixing activated sludge and fresh organic waste liquid in said return flow,

air-lift passing the return flow into said one aeration chamber adjacent the upper end thereof,

dosing the body of the liquor of said one aeration chamber with air in diffused bubble form for flocculating and air saturation of the sludge,

passing continuously from said liquor body a flow of the liquor to a subsequent of said aeration chambers having a second liquor body while diffusing air into said second body from the lower end of same for providing a liquor flow in which the flocculated sludge has assimilated the organic waste in the liquor flow,

continuously passing in a gravity flow to said separator chamber the organic waste assimilated liquor flow, and establishing and maintaining in said separator chamber and in said organic waste assimilated liquor flow a cyclone separating action effecting centrifugal force and gravity induced settling out of the sludge flow thereof to provide said return flow, and a rising effluent centrate flow,

continuously clarifying and discharging the centrate flow as tertiary quality effluent,

and continuously pumping said return flow and returning same to the upper end of said one aeration chamber to effect said mixing and said first mentioned passing steps.

4,501,665

SELF-CONTAINED SEWAGE TREATMENT SYSTEM AND METHOD

Thomas J. Wilhelmson, P.O. Box 2243, Redding, Calif. 96099

Filed Jun. 15, 1984, Ser. No. 621,191

Int. Cl.³ C02F *3/30*

U.S. Cl. 210—630 **13 Claims**

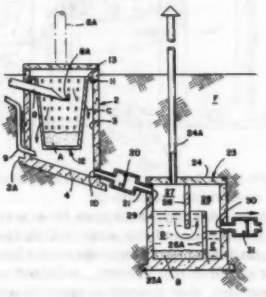
1. A unitized raw sewage treatment system comprising:

a first waterless tank means having suspended therein a

perforated basket means, said tank means having an inlet operable to deposit effluents entering said waterless tank into said perforated basket means and drain means located at the bottom of said waterless tank operable to flow liquids to its outlet means;

a septic tank means having an inlet, an outlet and at least one chamber therein operable to allow particular matter in effluents received in said septic said to settle to the bottom thereof; and

pipe means connecting said outlet of said waterless tank means with said inlet of said septic means whereby solid and semi-solid particulate wastes in raw sewage effluents entering said waterless tank means will be trapped in said basket means where said wastes will undergo aerobic digestion and liquid effluents egressing from said waterless tank will enter said septic tank means where particulate



wastes will therein undergo anaerobic digestion after when settling to the bottom of said septic tank means.

13. A method of treating raw sewage effluents containing solid and semi-solid wastes comprising the steps of:

flowing said effluents into a perforated basket means operable to separate the wastes from the liquids in the effluent;

providing air circulation about said perforated basket means to cause said wastes to undergo aerobic digestion;

collecting all liquids and small particles of the wastes beneath said basket means, including liquids released by the aerobic digestion action;

placing all the resulting collected matter in a septic system having a settling chamber where organic material in such matter will undergo further anaerobic digestion; and

disposing of the resulting liquids from the septic system in a leach field or the like.

4,501,666

PROCESS FOR THE REMOVAL OF BISMUTH AND ANTIMONY FROM AQUEOUS SULFURIC ACID SOLUTION CONTAINING BISMUTH AND/OR ANTIMONY

Takashi Ogata; Hiroshi Hosaka, and Shunichi Kasai, all of Toda, Japan, assignors to Nippon Mining Co., Ltd., Japan

Filed May 2, 1984, Ser. No. 606,372

Claims priority, application Japan, May 11, 1983, 58-82402

Int. Cl.³ C25C *1/12*

U.S. Cl. 210—688 **3 Claims**

1. A process for the selective removal of bismuth and/or antimony from an aqueous sulfuric acid solution containing dissolved bismuth and/or antimony mixed with other metals comprising bringing said sulfuric acid solution into contact with a phosphomethylamino chelate resin.

4,501,667

PROCESS OF INHIBITING CORROSION OF METAL SURFACES AND/OR DEPOSITION OF SCALE THEREON

Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 21, 1984, Ser. No. 582,213

Claims priority, application United Kingdom, Mar. 3, 1983, 8305933; Jun. 20, 1983, 8316711

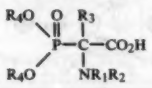
Int. Cl.³ C23F *11/00*

U.S. Cl. 210—700 **19 Claims**

1. Process for conditioning metal surfaces to inhibit their corrosion and/or to inhibit scale deposition thereon, by treating said surfaces:

(A) during contact with an aqueous system capable of corroding said metal surface or of depositing scale thereon, with

(i) a compound having the formula (I)



(I)

or a water-soluble salt (or partialester or -salt) thereof, wherein R_1 and R_2 are the same or different and each is hydrogen, a C_1–C_{12} straight- or branched chain alkyl group (optionally substituted by one or more hydroxy- and/or carboxyl groups and/or optionally interrupted by one or more oxygen atoms), a C_3–C_{12} straight- or branched chain alkenyl group, a C_7–C_{15} aralkyl group, or $—CH_2PO_3H_2$, or R_1 and R_2, together with the nitrogen to which they are each bonded, may form an optionally-substituted heterocyclic ring; R_3 is hydrogen, a C_1–C_{12} straight- or branched chain alkyl group or an optionally substituted C_6–C_{10} aryl group; and R_4 is hydrogen or a C_1–C_4 alkyl group; and optionally

(ii) a metal ion

(B) during contact with an aqueous system capable of corroding a metal surface or of depositing scale thereon, with (a) a compound of formula I or a water-soluble salt (or partial salt) thereof; and optionally (b) a metal ion which enhances, synergistically, the metal conditioning effected, individually, by the compound of formula I and the metal ion.

4,501,668

PROCESS FOR THE ELIMINATION OF HYDROGEN SULFIDE OR IRON SULFIDE FROM AN AQUEOUS SYSTEM

Wolfgang Merk, Tokyo, Japan, and Karl-Heinz Rink, Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,534

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245139

Int. Cl.³ C02F *1/00, 1/54*

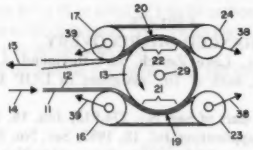
U.S. Cl. 210—749 **18 Claims**

1. A process for the elimination of hydrogen sulfide, iron sulfide or a mixture of iron sulfide and hydrogen sulfide from an aqueous system comprising adding to the system an effective amount of a water soluble low molecular weight condensation product of acrolein and formaldehyde in the molar ratio of 1:1 to 1:10, said condensation product having been produced in the presence of a basic catalyst, to react with said hydrogen sulfide, said iron sulfide, or said mixture, and form an odor free aqueous solution.

4,501,669
METHOD AND APPARATUS FOR REMOVING LIQUID FROM A SUSPENSION

Sven Hakansson, Nynäshamn, and Bengt Lundh, Hedemora, both of Sweden, assignors to Axel Johnson Engineering AB, Nynäshamn, Sweden

Filed Dec. 29, 1982, Ser. No. 454,191
Claims priority, application Sweden, Jan. 4, 1982, 8200023
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—770 **10 Claims**



1. A method for removing liquid from a suspension comprising conveying the suspension by at least one web partly around the surface of at least one press drum, applying a first substantially constant pressure to the web in the radial direction of the drum throughout a first pressure path extending along a first portion of the press drum surface, moving the web in the absence of any radially applied pressure on the web to a second pressure path extending along a second portion of the press drum surface spaced from the first portion and applying a second substantially constant pressure to the web in the radial direction of the drum throughout the second pressure path, the second pressure path being applied in a direction to at least partially balance the load on the press drum resulting from the first pressure.

4. Apparatus for removing liquid from a suspension comprising a press drum, at least one web passing in a path extending partly around the press drum to carry a suspension to be dried therearound, at least two spaced pressure means for applying substantially constant pressure to the web in the radial direction of the drum throughout corresponding spaced portions of the press drum surface which are separated by a portion of the web path extending around the drum in which no radial pressure is applied, the pressure means being positioned with respect to each other so as to substantially balance the load on the press resulting from the application of pressure by the pressure means.

4,501,670
RECOVERY OF OIL AND SULFONATE FROM FILTER CAKE

William H. Tyson, 1874 School St., Moraga, Calif. 94556, and Frank A. Stuart, 360 Riviera Dr., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 335,261, Dec. 23, 1981, abandoned. This application Jun. 20, 1983, Ser. No. 505,905
Int. Cl.³ B01D *12/00*
U.S. Cl. 210—770 **11 Claims**

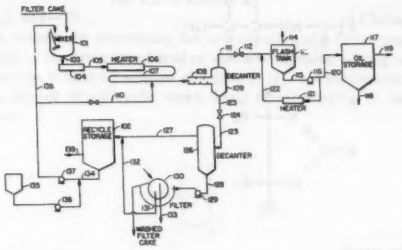
11. A process for treating a filter cake obtained by filtering oil containing an oil soluble alkaline earth metal sulfonate employing a siliceous filter aid, to recover oil and sulfonate from the filter cake which comprises,

(a) mixing the filter cake with about 1.5 to about 3 times its weight of a hot aqueous solution having a pH in the range 11 to 14 and containing as the solute a material selected from the group consisting of sodium hydroxide, sodium carbonate, sodium borate, sodium phosphate and mixtures thereof in a mixing zone,

(b) maintaining the resultant mixture at temperatures in the range 160°–300° F. for at least 5 minutes,

(c) passing the mixture from the mixing zone into a settling zone and adding to the mixture additional aqueous solution in amount sufficient to bring the weight ratio of the aqueous solution to filter cake to at least 4 to 1,

(d) maintaining the mixture obtained in step (c) quiescent at a temperature above 160° F. until it separates forming an upper oil layer and a lower layer containing aqueous solution and filter cake solids,



(e) withdrawing the oil layer,

(f) withdrawing the lower layer, filtering it, and returning at least a portion of the filtrate to the mixing zone, and

(g) washing the filter cake from step (f) with water or with dilute acid to obtain a washed filter cake having a pH below 12.

4,501,671
METHOD AND APPARATUS FOR TREATMENT OF OILY WASTE

Graydon C. Bazell, Poughkeepsie, N.Y., assignor to Alfa-Laval, Inc., Poughkeepsie, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,872
Int. Cl.³ B01D *33/02*
U.S. Cl. 210—781 **10 Claims**

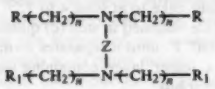
1. In the treatment of oily waste containing oil, water and solids, the method which comprises feeding said waste to a gravity settling tank and there separating the waste into a light oil phase and a heavy phase containing water, solids and residual oil, continuously withdrawing oil as an overflow stream from said tank, continuously passing heavy phase as an underflow from said tank to a first centrifuge and there centrifugally separating said underflow into a light component including oil with some water, an intermediate component which is mainly clarified water, and a heavy sludge component containing some water, continuously returning said light component to the settling tank, continuously and separately discharging said intermediate component from the centrifuge, and passing said separated sludge component to a second centrifuge and there centrifugally separating the sludge component into substantially dry solids and water.

4,501,672
ORGANIC COMPOUNDS

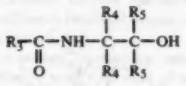
David L. Connell, and Jacqueline A. Coates, both of Leeds, England, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 25, 1983, Ser. No. 478,679
Claims priority, application United Kingdom, Mar. 30, 1982, 8209275; Mar. 30, 1982, 8209276
Int. Cl.³ C09K *7/06*
U.S. Cl. 252—8.5 M **17 Claims**

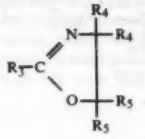
1. A fluid loss reducing additive for an oil-based well-working fluid which is the product of mixing together, in an oil or in a two-phase system comprising oil as a continuous phase and up to 15% by weight, based on the total weight of the mixture, of an aqueous disperse phase, lignite or humic acid with a compound containing no primary or secondary amine or amine salt groups and being of formula I, II or III below, or a mixture thereof



I



II



III

in which

each R, independently, and each R_1, independently, is —OH— or —NHCOR′, where R′ is C_{1-22}alkyl, C_{2-22}alkenyl or C_{2-6}hydroxyalkyl, provided that not more than one group R, and not more than one group R_1, is —OH,

each n, independently, is an integer from 2 to 6, Z is a difunctional bridging group, R_3 is C_{8-20}alkyl or C_{8-20}alkenyl,

each R_4, independently, is hydrogen, C_{1-4}alkyl or C_{1-4}-hydroxyalkyl, provided that both R_4's are not hydrogen, and each R_5, independently, has one of the significances of R_4, except that both R_5's may be hydrogen, wherein the proportion by weight of lignite or humic acid to total compound of formula I, II, or III is between 1:2 and 2:1.

4,501,673

COMPOSITIONS FOR USE IN OIL RECOVERY AND METHOD OF USE

Phillip K. G. Hodgson, Reading, England, assignor to The British Petroleum Company p.l.c., London, England

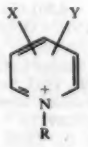
Filed Mar. 31, 1982, Ser. No. 363,864

Claims priority, application United Kingdom, Apr. 3, 1981, 8110559

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **3 Claims**

1. A method for recovering oil from a formation which method comprises the steps of injecting an aqueous medium containing a surfactant into the formation, displacing the oil from the formation and recovering the displaced oil, wherein the surfactant is a betaine of formula



wherein

R is C_8 to C_{24} alkyl which may optionally be substituted by inert substituents;

Y is H, CO_2^- or a SO_3^-;

when Y is H, X is CO_2^-, SO_3^- or $(CH_2)_m SO_3^-$ where m is 1 or 2;

when Y is CO_2^-, X is CO_2^-;

and when Y is SO_3^-, X is SO_3^-.

4,501,674

METHOD FOR REDUCING CORROSIVENESS OF AQUEOUS FLUIDS

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1982, Ser. No. 413,647

Int. Cl.³ C23F *11/14*

U.S. Cl. 252—8.55 D **26 Claims**

20. The method of claim 19 in which the aqueous fluid is contacted by tne enzyme by passing the aqueous fluid across the enzyme immobilized on an inert support.

4,501,675

ENHANCED OIL RECOVERY

Thomas P. Malloy, Lake Zurich, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 274,915, Jun. 18, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,717

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **8 Claims**

1. A process for the enhanced recovery of oil from a subterranean reservoir of oil which comprises the introduction of a three-component aqueous surfactant into said subterranean reservoir; the three components of said surfactant being:

(1) from about 1% to about 10% of a sulfonate of a gas oil having a molecular weight of from about 240 to about 550 and which has been obtained from the thermal cracking of coal;

(2) from about 1% to about 10% of a lower alkyl alcohol containing from about three to about six carbon atoms; and

(3) from about 0.1% to about 2% of a non-ionic ethoxylated normal alcohol containing from about 12 to about 15 carbon atoms; wherein said three components of said aqueous surfactant are present in a sufficient amount to reduce the interfacial tension between said oil and water.

4,501,676

POLYTETRAFLUOROETHYLENE SOLID LUBRICANT MATERIALS

Peter Moorhouse, Whitley Bay, England, assignor to International Research & Development Company, Newcastle-upon-Tyne, England

Filed Feb. 7, 1983, Ser. No. 464,723

Claims priority, application United Kingdom, May 19, 1982, 8214653

Int. Cl.³ C10M *7/02*

U.S. Cl. 252—12 **6 Claims**

1. In a wear-resistant bearing material comprising a substrate of beryllium-copper or of steel and a solid lubricant layer on the substrate, said lubricant layer being in the form of a matrix comprised principally of polytetrafluoroethylene with lead as an additive, the improvement wherein the lubricant layer additionally contains starch or partially pyrolized cellulose.

4,501,677

HETEROCYCLIC NITROGEN COMPOUNDS—ORGANOMETALLIC SALT COMPLEXES AS CORROSION INHIBITORS IN LUBRICATING OILS

Jacob J. Habeeb, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

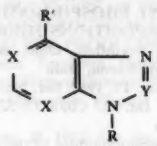
Filed Nov. 2, 1983, Ser. No. 547,984

Int. Cl.³ C10M *1/32, 1/54*

U.S. Cl. 252—37.2 **11 Claims**

1. A lubricating oil composition comprising a major amount of a lubricating oil basestock and an effective amount of a corrosion inhibitor comprising a complex of:

(a) a heterocyclic nitrogen compound having the formula:



where each x is C or N with at least one x being N; Y is C or N; R is H, alkyl of 1 to 20 carbons or $CH_2NR''_2$ where each R'' is H or alkyl of 1 to 20 carbons; and R' is H, alkyl of 1 to 20 carbons or NR'''_2 with each R''' being H or alkyl of 1 to 20 carbons; and

(b) an oil soluble organometallic salt having the formula:

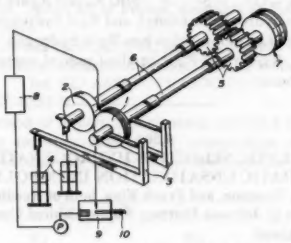
where M is an alkali metal, alkaline earth metal or transition metal selected from the group consisting of sodium, potassium, calcium, magnesium, chromium, manganese, iron, nickel, molybdenum, copper, zinc, tin and lead; R is the hydrocarbon portion of a linear or branched C_4 to C_{22} fatty acid and x is an integer equal to the valence of the metal M.

4,501,678

LUBRICANTS FOR IMPROVING FATIGUE LIFE

Takao Katayama, Ichihara, and Masahiko Takesue, Sodegaura, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

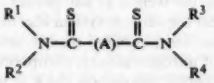
Filed Jun. 2, 1983, Ser. No. 500,264
Claims priority, application Japan, Jun. 9, 1982, 57/97774
Int. Cl.[3] C10M *1/48, 1/38*
U.S. Cl. 252—32.7 E **20 Claims**



1. A lubricant for improving fatigue life which comprises:

(1) a lubricating base material; and

(2) a compound having alkylthiocarbamoyl groups represented by the formula (i):



(i)

wherein R^1, R^2, R^3, and R^4 are each an alkyl group containing from 1 to 20 carbon atoms, R^1 and R^2, or R^3 and R^4 may be bound to each other to form a ring, and (A) is selected from the group consisting of S, S—S, S—S—S, S—S—S—S, S—S—S—S—S, and S—S—S—S—S—S.

4,501,679

BICYCLIC AMIDE KETAL DERIVATIVES

Robert L. Reierson; Hugh F. Hussey, and Edmund P. Woo, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 441,346, Nov. 15, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 582,104
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—77 **16 Claims**

8. A process for preventing the deterioration of a functional fluid due to the presence of acid or water comprising adding to the functional fluid an amount effective to prevent the deterioration thereof of a bicyclic amide ketal corresponding to the formula:

wherein R is hydrogen or a substituent of up to 20 carbons selected from the group consisting of alkyl, aryl and inertly-substituted derivatives thereof and R' each occurrence independently is a C_{2-3} alkylene optionally substituted group with up to 4 R'' groups, where R'' is a substituent of up to 10 carbons selected from the group consisting of alkyl, aryl, and inertly-substituted derivatives thereof.

4,501,680

ACIDIC LIQUID DETERGENT COMPOSITION FOR CLEANING CERAMIC TILES WITHOUT ERODING GROUT

Harry W. Aszman, Spotswood; Charles E. Buck, Caldwell, and Cherie H. Everhart, Califon, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

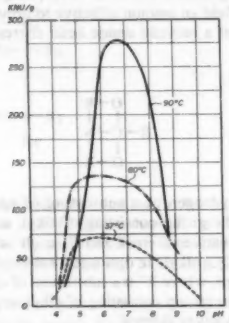
Filed Nov. 9, 1983, Ser. No. 550,247
Int. Cl.[3] C11D *7/08*
U.S. Cl. 252—142 **14 Claims**

1. An acidic liquid detergent composition, suitable for cleaning ceramic tiles without eroding grout between them, which comprises a minor proportion of glutaric acid, a lesser minor proportion of phosphoric acid, both acids being partially neutralized to a pH in the range of 3 to 5 and the detergent composition being at such pH, and the partially neutralized glutaric and phosphoric acids being present in such proportions that the proportion of partially neutralized glutaric acid in the composition is effective to remove soap scum from tiles and the proportion of partially neutralized phosphoric acid is effective to inhibit erosion of grout between the tiles by the partially neutralized glutaric acid, a minor proportion of a condensation product of ethylene oxide and higher linear alcohol of 8 to 20 carbon atoms, with the content of ethylene oxide being at least about 20 ethylene oxide groups per mole of the alcohol, which condensation product is effective in acid medium to lift soap scum off the tiles being cleaned, a minor proportion of a monolower alkyl ether or phenyl ether of diethylene glycol, wherein the lower alkyl is of 2 to 6 carbon atoms, with the proportion of such monoether of diethylene glycol being effective to assist in removing loosened soap scum from the tiles by helping to transport it away from the location where it was initially bonded to the tiles, and a major proportion of water, in which the partially neutralized glutaric acid, partially neutralized phosphoric acid, condensation product of ethylene oxide and linear alcohol, and diethylene glycol ether are dissolved.

4,501,681
DETERGENT DISH-WASHING COMPOSITION

Alain Groult, Annemasse, France, and Jean Samec, Geneva, Switzerland, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,527
Claims priority, application Switzerland, Dec. 23, 1981, 8234/81
Int. Cl.³ C11D *3/386, 3/39*
U.S. Cl. 252—174.12 4 Claims



1. Detergent dish-washing composition containing alkali metals polyphosphates and silicates, at least one non-ionic surfactant, at least one oxidizing agent, enzymes and optionally other conventional additives suitable for detergents, characterized in that said enzymes comprise at least one amylolytic enzyme whose activity is considered to be negligible at pH above 11.5, in that the oxidant is at least one mineral or organic peroxide and in that the alkali content is sufficient to provide a washing bath in a dish-washing machine with a pH above 12.2.

4,501,682
CLEANING AND PROTECTIVE COMPOSITION AND METHOD

Edward Goodman, 265 E. 66th St. - Apt. 11C, New York, N.Y. 10021; James P. Dux, and Fred R. Albright, both of Lancaster, Pa., assignors to Edward Goodman, New York, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,650
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C08L *83/04;* C09D *9/00;* C11D *7/30*
U.S. Cl. 252—174.15 13 Claims

1. An improved cleaning and protecting composition consisting of an admixture of poly(methylhydrosiloxane), tin octoate and zinc octoate in at least one solvent selected from the group consisting of cyclic poly(dimethylsiloxane)s, poly(dimethylsiloxane) oils, petroleum distillates and methylene chloride and wherein the tin octoate and zinc octoate are present in a weight ratio of 1:1.

4,501,683
RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, and Junji Miyahara, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1983, Ser. No. 528,251
Claims priority, application Japan, Sep. 1, 1982, 57-150740
Int. Cl.³ G03C *5/16*
U.S. Cl. 252—301.26 7 Claims

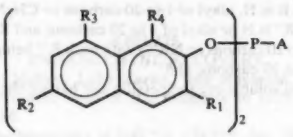
1. A radiation image storage panel comprising a support, a phosphor layer provided thereon which comprises a binder and stimulable phosphor particles dispersed therein, and a protective film provided on said phosphor layer, characterized in that said protective film has a haze value within the range of 4–40%.

4,501,684
2-NAPHTHYL PHOSPHORAMIDITES AND COMPOSITIONS THEREOF

Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 17, 1983, Ser. No. 505,540
Int. Cl.³ C09K *15/32*
U.S. Cl. 252—400 A 14 Claims

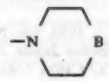
1. 2-naphthyl phosphoramidites of the general formula



wherein A is

wherein R is an alkyl radical containing 1 to 4 carbon atoms;

wherein a is 3 to 6; or



where B is —O—, —S—, or —NR; R_1 and R_2 are hydrogen or alkyl, R_3 is hydrogen or t-butyl, and R_4 is hydrogen or methyl, ethyl, propyl or isopropyl when R_3 is hydrogen, and at least one of R_1, R_2, R_3 and R_4 is an alkyl radical containing 1 to 4 carbon atoms.

4,501,685
CATALYTIC SELECTIVE HYDROGENATION OF ALIPHATIC UNSATURATION IN COPOLYMERS

Alasdair I. Thomson, and Frank King, both of Reading, England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Sep. 8, 1983, Ser. No. 530,360
Claims priority, application United Kingdom, Sep. 10, 1982, 8225813
Int. Cl.³ C08G *69/26*
U.S. Cl. 502—167 18 Claims

1. A catalyst system comprising from 0.1 to 5% by weight of palladium supported on particulate carbon black (the percentage being based on the weight of non-porous carbon black in the system) wherein the catalyst system also includes a poison comprising at least one poisoning moiety selected from the group consisting of nitrogen moiety, phosphorous moiety and sulphur moiety wherein the carbon black is non-porous and wherein the ratio of the number of atoms of poisoning moiety in the poison to the number of atoms of palladium in the catalyst system is from 0.0005 to 0.25:1, said catalyst system being characterized by its high selectivity for hydrogenation of aliphatic unsaturation in copolymers which also include aromatic unsaturation.

4,501,686

ANION-DOPED POLYMERS OF FIVE-MEMBERED OXYGEN FAMILY HETEROCYCLIC COMPOUNDS AND METHOD FOR PRODUCING SAME

Shu Hotta, Hirakata; Tomiharu Hosaka, Yawata; Nobuo Sonoda, Settsu, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 25, 1983, Ser. No. 488,598
Claims priority, application Japan, Apr. 26, 1982, 57-70054; May 13, 1982, 57-80895; Jun. 17, 1982, 57-104924; Sep. 2, 1982, 57-153009
Int. Cl.³ H01B 1/06
U.S. Cl. 252—500 8 Claims

1. A conductive or semiconductive polymeric material consisting essentially of a polymer having recurring units of a five-membered oxygen family heterocyclic ring selected from the group consisting of unsubstituted furan, thiophene, selenophene and tellurophene rings, and furan, thiophene, selephene and tellurophene rings which may be substituted by one or two substituents selected from the group consisting of halogen, hydroxyl, amino and a hydrocarbon group of up to 8 carbon atoms, and anions doped in said polymer and selected from the group consisting of anion radicals of tetrahalogenoborates, perhalogenates, hexahalogenophosphates, hexahalogenoarsenates, hexahalogenoantimonates, sulfate, benzenesulfonate, tetracyanoquinodimethane and derivatives thereof, and mixtures thereof, whereby said polymeric material becomes electrically conductive or semiconductive, there being sufficient anions doped in said polymer to provide improved conductivity of said polymer.

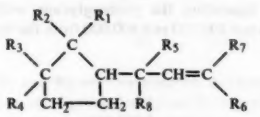
4,501,687

CYCLOPENTANOLS

Jacques Martel, Bondy; Jean Buendia, Le Perreux, and Francois Nezot, Thiais, all of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 30, 1981, Ser. No. 325,992
Claims priority, application France, Dec. 5, 1980, 80 25869
Int. Cl.³ A61K 7/46; C07C 35/06
U.S. Cl. 252—522 R 8 Claims

1. A method of imparting a pleasant odor to a composition comprising incorporating into a composition a sufficient amount of at least one compound of the formula



wherein R_1 and R_2 are identical and are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_3 is selected from the group consisting of —OH, alkoxy of 1 to 8 carbon atoms and acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, R_4 is selected from the group consisting of hydrogen and alkyl of 1 to 8 carbon atoms, R_5 and R_8 are individually selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and alkenyl and alkynyl of 2 to 8 carbon atoms and R_6 and R_7 are individually selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, —CN, $—COCH_3$ and $—COOAlK_2$ and AlK_2 is alkyl of 1 to 8 carbon atoms to impart a pleasant odor therein.

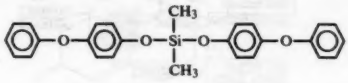
4,501,688

SILANE OLIGOMERS USEFUL AS ANTI-TREEING ADDITIVES

Harry Braus, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,980
Int. Cl.³ H02G 15/24
U.S. Cl. 252—573 5 Claims

1. A silane oligomer having the general structure:



4,501,689

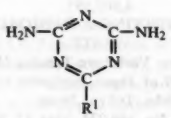
PHOTOPOLYMERIZABLE COMPOSITION

Makoto Yanagawa, No. 7-20, Minamidai 1-chome, Kamifukuoka-shi, Saitama-ken, Japan

Filed Sep. 26, 1983, Ser. No. 536,061
Int. Cl.³ H01L 13/00
U.S. Cl. 252—600 18 Claims

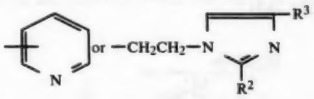
1. A photopolymerizable composition which comprises:

(a) 0.1 to 5.0 wt. % of a s-triazine compound represented by general formula I:



(I)

[wherein R^1 stands for



(wherein R^2 stands for a hydrogen atom, an alkyl group or a phenyl group and R^3 stands for a hydrogen atom or a lower alkyl group)];

(b) 5 to 50 wt. % of a photopolymerizable oligomer which has an average molecular weight in the range of 200 to 4000 and has 2 or more of acryloyl groups or methacryloyl groups in a molecule;

(c) 5 to 50 wt. % of vinyl monomer having 1 or more of acryloyl groups or methacryloyl groups which are liquid at 50° C.;

(d) 0.5 to 5 wt. % of a photo-initiator which acts to initiate a cross-linking reaction between said photopolymerizable oligomer and said vinyl monomer when subjected to activated radiation; and

(e) 5 to 60 wt. % of an inorganic filler.

4,501,690

PROCESS FOR TREATING RADIOACTIVE SALT CAKE

Donald R. Ross, 2329 N. Recker Rd. #19, Mesa, Ariz. 85205

Division of Ser. No. 127,452, Mar. 5, 1980,. This application Sep. 24, 1982, Ser. No. 423,116
Int. Cl.³ G21F 9/16
U.S. Cl. 252—628 3 Claims

1. A process for treating radioactive salt cake, said process comprising:

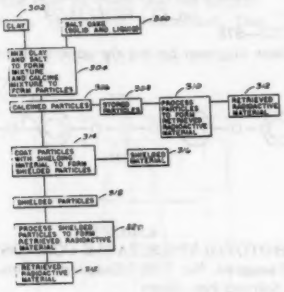
a. mixing said radioactive salt cake with clay;

b. heating said mixture to form calcined particles;

c. in heating said mixture burning fuel in the presence of said

mixture to heat said mixture to assist in forming said calcined particles;

d. contacting said mixture with a hot surface to assist in forming said calcined particles;



e. reflecting heat energy radiating from said hot surface toward said mixture on said hot surface to assist in forming said calcined particles; and,

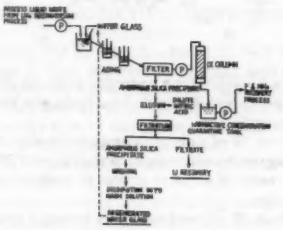
f. said calcined particles being a solid.

4,501,691

PROCESS FOR TREATING A RADIOACTIVE LIQUID WASTE

Shoichi Tanaka, Tokyo; Yoshiharu Tanaka, Okayama, and Eiji Takano, Ibaragi, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 149,034, May 12, 1980, abandoned.
This application Sep. 3, 1982, Ser. No. 414,915
Claims priority, application Japan, Dec. 25, 1979, 54-169076
Int. Cl.³ G21F *9/10*
U.S. Cl. 252—631 **1 Claim**



1. In a system for treating a radioactive liquid waste which comprises removing uranium and β-decay nuclides in solution from a radioactive liquid waste containing uranium and β-decay nuclides by an ion exchange process, the improvement comprising treating said radioactive liquid waste by a flocculation method using water glass as pretreatment of said ion exchange method to make a precipitate composed substantially of an amorphous silica and substantially all of said uranium and a part of said β-decay nuclides which are captured by said precipitate when it is formed, treating said precipitate capturing substantially all of said uranium and a part of β-decay nuclides with a dilute acid to make said captured uranium and β-decay nuclides elute, recovering said eluted uranium and β-decay nuclides as an acidic solution by filtering out said precipitate and dissolving said filtered out precipitate in an alkali metal hydroxide solution to regenerate said amorphous silica constituting said precipitate to water glass, thereby resulting concurrently in a substantial reduction of radioactive material in a final drain to be discharged and deterioration of ion exchange resin, a substantially complete recovery of of said uranium and a part of β-decay nuclides from said radioactive liquid waste and further, a substantially complete prevention of the generation of radioactive decay products of uranium on said ion exchange resins.

4,501,692

CHARGE EFFECTS IN ENZYME IMMUNOASSAYS

Ian Gibbons, Menlo Park; Gerald L. Rowley, Cupertino, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 61,099, Jul. 26, 1979, Pat. No. 4,287,300.
This application May 1, 1982, Ser. No. 259,629
Int. Cl.³ A61K *35/14, 37/00, 39/00*
U.S. Cl. 260—112 B **1 Claim**

1. A compound of the formula

Receptor—RX)n

wherein:

Receptor is antibody;

R is a bond or linking group of from about 1 to 10 carbon atoms and from 0 to 4 heteroatoms which heteroatoms are oxygen or sulfur where oxygen is present as oxy or oxo and sulfur is present as thio or thiono;

X is phenoxy;

n is on the average in the range of molecular weight of Receptor divided by from 500 to 10,000;

said compound having a negative charge greater than that of said Receptor.

4,501,693

METHOD OF PREPARING IMMUNOSTIMULANT PROTEOGLYCANS WHICH INDUCE PRODUCTION OF INTERFERON, PROTEOGLYCANS OBTAINED AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Lucien Dussourd d'Hinterland; Gérard Normier, and Anne-Marie Pinel, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Filed Mar. 3, 1983, Ser. No. 471,641
Claims priority, application France, Mar. 9, 1982, 82 03921
Int. Cl.³ A61K *37/102, 39/108, 39/40;* C07G *7/00*
U.S. Cl. 260—112 R **8 Claims**

1. A method of preparing bacterial membranous proteoglycans which induce production of interferon from soluble membranous proteoglycans of a strain of gram-negative bacterium, which comprises hydrolyzing the soluble membranous proteoglycans of a strain of gram-negative bacterium by lysozyme, and separating the proteoglycans with a molecular weight between 200,000 and 400,000 from the hydrolysis product.

4,501,694

PHOSPHORYLATED SOYBEAN PROTEIN

Motohiko Hirotsuka, Izumisano, and Makoto Kito, Kyoto, both of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Dec. 27, 1983, Ser. No. 566,024
Claims priority, application Japan, Dec. 28, 1982, 57-229416
Int. Cl.³ A23J *1/14*
U.S. Cl. 260—123.5 **3 Claims**

1. A phosphorylated soybean protein which comprises soybean protein and ortho-phosphate bonded to lysine and histidine residue constituents of the soybean protein, the ratio of bonded phosphorus to nitrogen in the soybean protein being 25 μg/mg nitrogen or more and the isoelectric point of the phosphorylated soybean protein being pH 3.5 or lower.

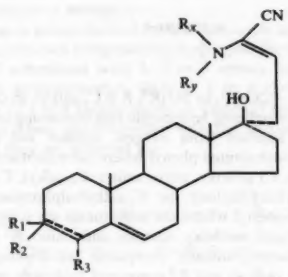
4,501,695

SPIRONALACTONE PROCESS

Verlan H. Van Rheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 16, 1983, Ser. No. 494,740
Int. Cl.³ C07J 19/00
U.S. Cl. 260—239.57 45 Claims

1. A compound of formula II



wherein

(i) R_1 represents a group —OR_4 in which R_4 represents a hydrogen atom, an alkyl or alkoxyalkyl group or a

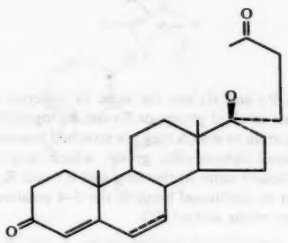
wherein R_5 represents a hydrogen atom or an alkyl group and R_6 represents an alkyl group or R_5 and R_6 together with the carbon and oxygen atoms in which they are attached represent a 5- or 6-membered heterocyclic group, and R_2 and R_3 each represent a hydrogen atom; or

(ii) R_1 and R_2 are the same or different and each represents a group —OR_4, wherein R_4 represents an alkyl group, or R_1 and R_2 together represent an alkylendioxy group having 2 or 3 carbon atoms in the alkylene moiety, and R_3 represents a hydrogen atom; or

(iii) R_1 represents a group —OR_4, or a group

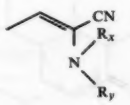
wherein R_7 and R_8 are the same or different and each represents an alkyl group, or R_7 and R_8 together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic group, which may contain a further hetero atom in the ring, and R_2 and R_3 together represent an additional bond in the 3–4 position; R_x and R_y are the same or different and each represents alkyl of 1 to 5 carbon atoms, aryl of 6 thru 10 carbon atoms or substituted aryl, or R_x and R_y taken together form a 5-, 6- or 7-membered heterocyclic group, which may contain in the ring further hetero atom, selected from the group consisting of nitrogen, oxygen or sulfur.

14. A process for the preparation of 17α-(2-carboxyethyl)-17β-hydroxy-androst-4-en-3-one lactone and 17α-(2-carboxyethyl)-17β-hydroxy-androsta-4,6-diene-3-one lactone of the formula I':



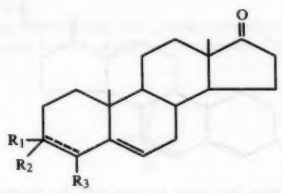
wherein the dotted line between the 6–7 positions indicates the additional double bond of the latter compound, which comprises:

(1) treating a disubstituted amino nitrile of formula A



where R_x and R_y are the same or different and each represents alkyl of 1 to 5 carbon atoms, aryl of 6 thru 10 carbon atoms or substituted aryl, or R_x and R_y taken together form a 5-, 6- or 7-membered heterocyclic group, which may contain in the ring a further hetero atom, selected from the group consisting of nitrogen, oxygen or sulfur, with an alkali metal amide deprotonating agent;

(2) reacting the resultant deprotonated nitrile with a 3-protected androst-5-ene-17-one derivative of formula I:



wherein

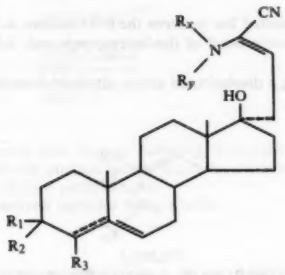
(i) R_1 represents a group —OR_4 in which R_4 represents a hydrogen atom, an alkyl or alkoxyalkyl group or a

wherein R_5 represents a hydrogen atom or an alkyl group and R_6 represents an alkyl group or R_5 and R_6 together with the carbon and oxygen atoms in which they are attached represent a 5- or 6-membered heterocyclic group and R_2 and R_3 each represent a hydrogen atom; or

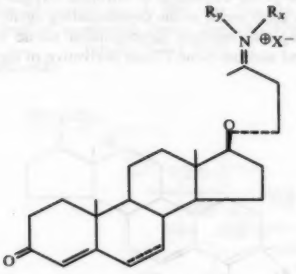
(ii) R_1 and R_2 are the same or different and each represents a group —OR_4, wherein R_4 represents an alkyl group, or R_1 and R_2 together represent an alkylenedioxy group having 2 or 3 carbon atoms in the alkylene moiety, and R_3 represents a hydrogen atom;

(iii) R_1 represents a group —OR_4, or a group

wherein R_7 and R_8 are the same or different and each represents an alkyl group, or R_7 and R_8 together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic group, which may contain a further hetero atom in the ring and R_2 and R_3 together represent an additional bond in the 3–4 position; to give the amino nitrile adduct (II)



where R_1, R_2, R_3, R_x and R_y are as hereinbefore defined; (3) acidifying the amino nitrile adduct (II) with an acid to form the imino lactone (III); and



(4) neutralizing the imino lactone (III) by reaction with a base to give a 17-spiro-γ-lactone of formula I'.

4,501,696

PROCESS FOR THE PREPARATION OF PENAM DERIVATIVES

John R. M. Dales, Littlehampton, and Marguerita A. Vallance, Worthing, both of England, assignors to Beecham Group p.l.c., England

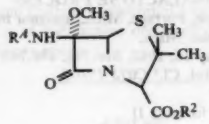
Filed Jul. 9, 1982, Ser. No. 396,646

Claims priority, application United Kingdom, Jul. 10, 1981, 8121303

Int. Cl.³ **C07D** *499/04;* **A61K** *31/425*

U.S. Cl. 260—245.2 R **11 Claims**

1. A process for the preparation of a penam derivative of formula (I):

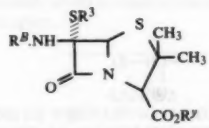


(I)

wherein R^A is hydrogen or a group of formula (Ia):

(Ia)

wherein X is $—CO_2R^1$, or SO_3R^1; R is C_{1-6}alkyl, an optionally substituted 5-membered heterocylic ring containing one or two heteroatoms selected from oxygen, sulphur and nitrogen; phenyl; mono-substituted phenyl where the substituent is halogen, hydroxy, C_{1-6}alkoxy, nitro, amino, C_{1-6}alkyl, C_{1-6}haloalkyl, C_{1-6}alkylcarbonyloxy, or C_{1-6}alkylsulphonylamino; or di-substituted phenyl where the substituents are selected from hydroxy, halogen, methoxy, acetoxy, and amino; R^1 is hydrogen, or a pharmaceutically acceptable salt-forming ion or ester-forming radical, and R^2 represents hydrogen or a pharmaceutically acceptable salt-forming ion or in vivo hydrolysable ester-forming radical; which process comprises reacting a compound of formula (II):



(II)

wherein R^B is hydrogen, a removable amino blocking group, or a group of formula (IIa):

(IIa)

wherein Y is $—CO_2R^x$ or $—SO_3R^x$; R is as defined with respect to formula (Ia) above; R^x represents an ester-forming radical, R^Y represents hydrogen, a salt-forming radical or a carboxyl-blocking group, and R^3 represents an alkyl, benzyl, or aryl group; with methanol in the presence of copper ions; and thereafter if necessary carrying out one or more of the following steps:

(i) removal of any blocking group;

(ii) converting the product to a pharmaceutically acceptable salt or ester thereof.

4,501,697

4-[[(AMIDOMETHYL)OXY]METHYL]-2-OXO-1-AZETIDINESULFONIC ACID SALTS

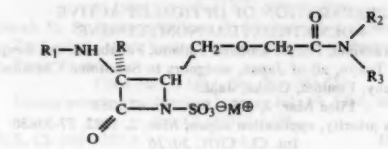
David Kronenthal, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 17, 1983, Ser. No. 505,547

Int. Cl.³ **C07D** *205/08, 403/12, 403/13, 401/12*

U.S. Cl. 260—245.4 **11 Claims**

1. A compound having the formula

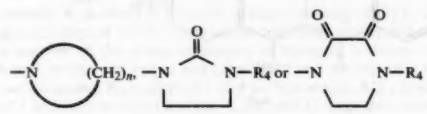


wherein

R is hydrogen or methoxy;

R_1 is an acyl group derived from a carboxylic acid;

R_2 and R_3 are each independently hydrogen, alkyl, phenyl or phenyl substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups, or R_2 and R_3 when taken together with the nitrogen atom to which they are attached are



wherein n is 4 or 5 and R_4 is hydrogen, alkyl or amino; and

$M^{\oplus}$ is hydrogen or a pharmaceutically acceptable cation;

wherein the term "alkyl" refers to groups having 1 to 10 carbon atoms.

4,501,698

PREPARING 1-(HYDROXYMETHYL)-TRIAZOLOBENZODIAZEPINES AND 1-(AMINOMETHYL)-TRIAZOLOBENZODIAZEPINES

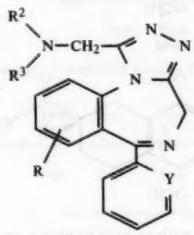
John R. Palmer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 31, 1983, Ser. No. 480,978

Int. Cl.[3] **C07D** *487/04*

U.S. Cl. 260—245.5 **5 Claims**

1. A process for preparing a 1-aminomethyl-6-substituted-4H-s-triazolo[4,3-a][1,4]benzodiazepine of the formula



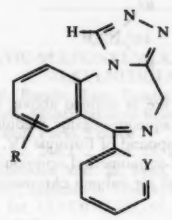
(IV)

wherein R is hydrogen, fluoro, chloro, bromo, trifluoromethyl or nitro

R_2 and R_3 are each hydrogen, C_1 to C_3-alkyl, or R_2 and R_3 are taken together with the nitrogen to which they are bonded to complete a monocyclic, saturated amine ring; selected from the group consisting of N-pyrrolidinyl, N-piperidinyl and N-piperazinyl and Y is a trivalent nitrogen or a $—CR_3=$ moiety where R_3 is hydrogen, fluoro or chloro;

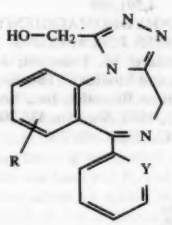
which comprises

heating a mixtutre of paraformaldehyde and a compound of the formula



(I)

where R and Y are as defined hereinabove, in an inert liquid solvent under essentially neutral pH conditions at atmospheric pressure and at a temperature sufficient to dissolve the compound (I) therein and to crack the paraformaldehyde to a reactive form of formaldehyde for a time up to about 5 hours to form a 1-(hydroxymethyl)-compound of the formula



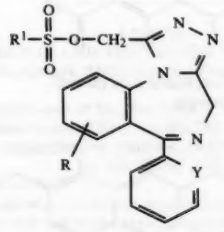
(II)

wherein R and Y are as defined hereinabove, without formation of 1,4-bis(hydroxymethyl)-substitution

separating the 1-hydroxymethyl-product (II) from its preparation mixture without using column chromatography procedures;

contacting and reacting the 1-(hydroxymethyl) compound of Formula II with a sulfonyl compound of the formula

where R^1 is C_1 to C_3-hydrocarbon radical, and Z is chloro or bromo, for a time sufficient to form a sulfonate ester of the formula



(III)

where R, R^1 and Y are as defined above, and

contacting and reacting the sulfonyl ester compound III with a compound of the formula

Where R^2 and R^3 are as defined above, in an aqueous, organic, or mixed aqueous-organic medium to form the 1-aminomethyl compound of Formula IV,

and recovering the 1-aminomethyl compound of Formula IV without the need for column chromatography procedures.

4,501,699

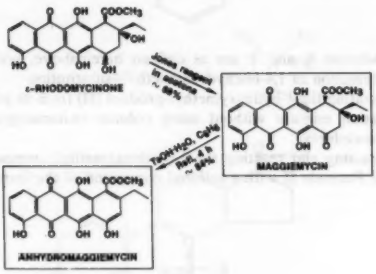
MAGGIEMYCIN, ANHYDROMAGGIEMYCIN AND PROCESSES FOR MAKING

Ramesh C. Pandey; Margaret W. Toussaint; Jeffrey C. McGuire, all of Frederick, and Monica C. Thomas, Columbia, all of Md., assignors to Litton Bionetics, Inc., Kensington, Md.

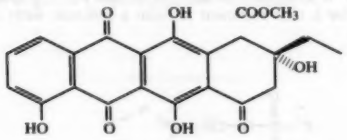
Filed Nov. 1, 1982, Ser. No. 438,306

Int. Cl.³ C07C *49/798*

U.S. Cl. 260—351.1 **4 Claims**

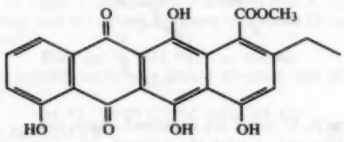


1. Maggiemycin,



and physiologically acceptable salts thereof.

2. Anhydromaggiemycin,



and physiologically acceptable salts thereof.

4,501,700

PREPARATION OF OPTICALLY ACTIVE 4-DEMETHOXYDAUNOMYCINONE

Shiro Terashima, Tokyo; Katsumi Tamoto, Funabashi, and Kenji Koga, Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

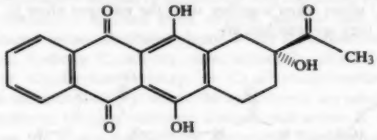
Filed Mar. 2, 1983, Ser. No. 471,354

Claims priority, application Japan, Mar. 2, 1982, 57-33650

Int. Cl.³ C07C *50/36*

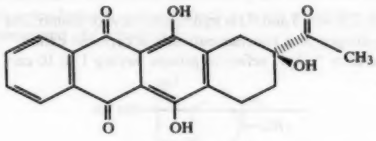
U.S. Cl. 260—351.5 **6 Claims**

1. A process for preparing racemic 4-demethoxy-7-deoxydaunomycinone which comprises methylating the optically active α-hydroxyketone of either one of the formulas:



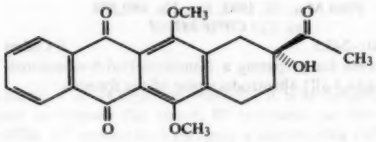
(IV-A)

and



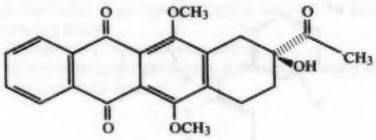
(IV-B)

to give the corresponding methylated product of either one of the formulas:



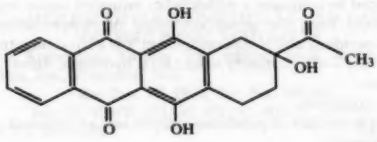
(V-A)

and



(V-B)

and reacting the latter with an acid to give a racemate of the α-hydroxyketone of the formula:



(I)

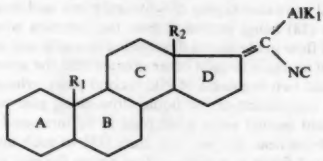
4,501,701

20-ISOCYANO-$\Delta^{17(20)}$-STEROIDS

Derek H. R. Barton; William B. Motherwell, and Sammir Z. Zard, all of Gif sur Yvette, France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 7, 1981, Ser. No. 281,552
Claims priority, application France, Jul. 15, 1980, 80 15603
Int. Cl.³ C07J 1/00
U.S. Cl. 260—397.4 18 Claims

1. A 20-isocyano-$^{17(20)}$-steroid of the formula



wherein R_1 is selected from the group consisting of (1) hydrogen, (2) alkyl of 1 to 4 carbon atoms optionally substituted with a member of the group consisting of halogen, hydroxy, carbonyl, amino and cyano and (3) alkenyl and alkynyl of 2 to 4 carbon atoms, R_2 is alkyl of 1 to 4 carbon atoms, AlK_1 is alkyl of 1 to 8 carbon atoms and the A,B,C and D rings may contain one or more double bonds and may be optionally substituted with at least one member of the group consisting of —OH, =O, halogens, alkyl and alkoxy of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms.

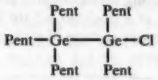
4,501,702

GERMANIUM COMPOUNDS

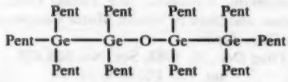
Eric J. Bulten, Blaricum, and Antonius M. J. Liebregts, Nieuwegein, both of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed May 29, 1981, Ser. No. 268,139
Claims priority, application Netherlands, May 30, 1980, 8003159; May 8, 1981, 8102268
Int. Cl.³ C07F 7/30
U.S. Cl. 260—429 R 9 Claims

1. A germanium compound having the formula:



2. A germanium compound having the formula:



4,501,703

PROCESS FOR PREPARING 2-ACETYLTHIOMETHYL-5-GUANIDINOPENTANOIC ACID

Russell L. Barton, Indianapolis; Stephen L. Briggs, Clayton, and Gary A. Koppel, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 12, 1982, Ser. No. 441,138
Int. Cl.³ C07C 153/017
U.S. Cl. 260—455 R 2 Claims

1. A process for preparing 2-acetylthiomethyl-5-guanidinopentanoic acid, which comprises treating 2-acetylthiomethyl-5-aminopentanoic acid with 1-guanyl-3,5-dimethylpyrazole in a solvent comprising a hydroxylated solvent selected from the group consisting of water, alcohols, and glycols.

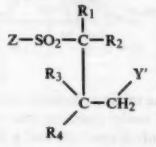
4,501,704

AROMATIC SULFONYL ALKANOATES AND ALKYLNITRILES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 246,172, Mar. 23, 1981, Pat. No. 4,408,601. This application Mar. 28, 1983, Ser. No. 479,163
Claims priority, application France, Mar. 28, 1980, 80 06979
Int. Cl.³ C07C 121/66, 147/107
U.S. Cl. 260—465 R 2 Claims

1. A compound of the formula



wherein Z is a monocyclic aryl, Y' is selected from the group consisting of —CN and —COOR', R' is alkyl of 1 to 6 carbon atoms and R_1, R_2, R_3 and R_4 are individually selected from alkyl of 1 to 4 carbon atoms or R_1 and R_2 or R_3 and R_4 together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 6 carbon atoms with the 2 substituents not forming the ring being alkyl of 1 to 4 carbon atoms or R_1 and R_2 or the one hand and R_3 and R_4 on the other together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 6 carbon atoms.

4,501,705

PROCESS FOR PRODUCING AN ACETAL

Kanenobu Matsui; Shinichiro Uchiumi; Akira Iwayama, and Takashi Umezu, all of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Division of Ser. No. 475,750, Mar. 16, 1983, , which is a continuation of Ser. No. 333,110, Dec. 21, 1981, abandoned. This application Jun. 14, 1983, Ser. No. 504,322
Claims priority, application Japan, Dec. 23, 1980, 55-181332; Dec. 23, 1980, 55-181333; Jul. 30, 1981, 56-118410
Int. Cl.³ C07C 120/00, 41/06
U.S. Cl. 260—465.6 10 Claims

1. A process for producing an acetal comprising the steps of:

introducing an olefin, an alcohol, and an ester of nitrous acid into a reaction system; and

contacting, in a vapor phase, the olefin, the alcohol, and the ester of nitrous acid in the presence of (a) at least one component selected from the group consisting of platinum group metals and the salts thereof and (b) a copper halide.

4,501,706

CARBURETOR AND SYSTEM FOR UTILIZING SAME

Thaddeus Kowalczyk, 8163 Lochdale, Dearborn Heights, Mich. 48127

Continuation-in-part of Ser. No. 526,628, Aug. 29, 1983, , and a continuation-in-part of Ser. No. 602,716, Apr. 23, 1984,. This application Jul. 16, 1984, Ser. No. 631,056
Int. Cl.³ F02M 23/02
U.S. Cl. 261—50 R 7 Claims

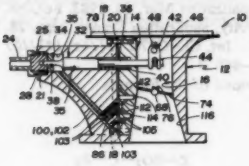
1. An apparatus for supplying an internal combustion engine with vaporized fuel mixed with air in an explosive mixture, the apparatus comprising:

a housing having at least one central aperture including a mixing chamber, the aperture extending completely through the housing between top and bottom surfaces

thereof, the housing also having a fuel inlet for receiving pressurized fuel and an air inlet for receiving pressurized air;

regulating means disposed within said housing for controlling the flow of pressurized air and fuel therein; and

control means disposed in said housing for controlling the flow of air into said mixing chamber from the top surface of said housing; said housing including a plate having an outer face defining a side wall of said mixing chamber and having at least one vaporizer communicating the air and



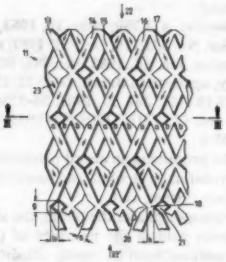
fuel inlets with the mixing chamber, said vaporizer including a central fuel outlet opening into the mixing chamber transverse the central aperture and a plurality of inclined air outlets spaced about the fuel outlet for directing the pressurized air against the fuel in the fuel outlet to vaporize the fuel and to force the vaporized fuel into the mixing chamber for mixing with air allowed therein from the top surface by said control means, the vaporized fuel and air mixture thereafter freely flowing from the mixing chamber and out of said housing at its bottom surface.

4,501,707

PACKING FOR MATERIAL EXCHANGE COLUMNS

Ulrich Bühlmann, Allschwil, Switzerland, assignor to Kuhni AG, Switzerland

Filed Jul. 7, 1982, Ser. No. 395,996
Claims priority, application Switzerland, Jul. 8, 1981, 4480/81
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—94 **14 Claims**



1. Packing (11) for vapor-liquid and gas-liquid contacting in a material exchange column (35) with liquid supply means (22) and vapor or gas supply means (22') and a cavity below said liquid supply means (22) for receiving at least one packing, the liquid supplied by the liquid supply means (22) flowing downward through the packing and the vapor or gas supplied by the vapor or gas supply means (22') streaming in vertical direction through the packing, the packing (11) comprising a plurality of laminated grids (a, b, c, . . .) each having a grid plane (A, B, C, . . .), each grid (a, b, c, . . .) being formed of one integral piece and consisting of a plurality of approximately zigzag-shaped bent laminated strips (13–17), adjacent strips (13/14, 14/15, 15/16, 16/17) of each grid (a, b, c, . . .) being interconnected at their bending points so as to form thereat areal junction zones (18) of the grid (a, b, c, . . .), each laminated strip (13–17) having segments following each other successively in zigzag being inclined toward the grid plane (A, B, C, . . .) and the segments of adjacent strips (13,14,14/15,15/16, 16/17) bounding substantial quadrilateral mesh openings having a larger and a smaller diagonal, the segments bounding each of said mesh openings diverging in a first pair at an acute angle from one end of said larger diagonal and converging in a second pair at an acute angle toward the other end of said larger diagonal, and the packing (11) being adapted to be mounted in the cavity of a column (35) in such a way that said larger diagonals are substantially vertical and parallel to the liquid and to the vapor or gas flow; the lower portions of the two segments of each of said second pairs converging downwardly into said areal junction zones (18) being provided near the junction zones (18) with liquid flow guide means descending towards said junction zone (18) at an angle to each other greater than the acute angle between said two segments of said second pairs, whereby the horizontal component of the liquid flow along said two segments of said second pairs is adapted to be increased at said lower portions near the junction zone (18) to such an extent that the liquid flows to a major extent across the said junction zone (18) and that on the other hand the liquid does not trickle off or dam up at the liquid flow guide means.

4,501,708

REPAIR PAD AND NOZZLE FOR COOLING TOWER

Charles E. Shepherd, 4202 Markham, Houston, Tex. 77027

Filed Aug. 3, 1982, Ser. No. 404,696
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—111 **6 Claims**

1. In combination, a repair pad for use with a cooling tower spray nozzle, comprising: a generally flat flange having a central opening for receiving said spray nozzle; a generally cylindrical mounting element attached to said flange at said central opening and depending from said central opening for attachment to a body of said spray nozzle; and

a spray nozzle having a generally cylindrical body received in said cylindrical mounting element, a mounting flange connected to one end of said body and disposed in contact with an upper surface of said flat flange, dispersion means connected to the opposite end of said cylindrical body for dispersing liquid contacting said dispersion means, and means for holding said spray nozzle in said generally cylindrical mounting element, said holding means comprising a plurality of circumferentially spaced radially outwardly projecting elements mounted to said generally cylindrical body at a position where said projecting elements engage a lower surface of said generally cylindrical mounting element.

4,501,709

VARIABLE VENTURI CARBURETOR

Tadahiro Yamamoto, Yokosuka, and Tadaki Oota, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 28, 1983, Ser. No. 566,405
Int. Cl.³ F02M *9/14*
U.S. Cl. 261—44 D **3 Claims**

1. A variable venturi carburetor for an engine, which comprises:

(a) a carburetor body formed with a main fixed venturi portion, said carburetor body forming a main intake passage;

(b) a fuel supply member formed with a first nozzle, a second nozzle and an auxiliary fixed venturi portion on the outer surface thereof;

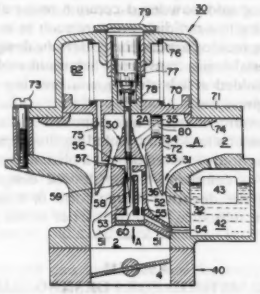
(c) a suction piston formed with a main movable venturi portion, an auxiliary movable venturi portion and a communication hole, said piston forming an auxiliary intake passage therewithin, the main intake passage communicating with the auxiliary intake passage through the communication hole;

(d) a main venturi formed between the main fixed venturi

portion of said carburetor body and the main movable venturi portion of said suction piston;

(e) an auxiliary venturi formed between the auxiliary fixed venturi portion of said fuel supply member and the auxiliary movable venturi portion of said suction piston;

(f) said suction piston being moved toward or away from



said fuel supply member by the vacuum generated due to air passing through the auxiliary venturi; and

(g) a tapered jet needle attached to said suction piston so as to pass through the second nozzle portion formed in said fuel supply member in order to increase the amount of fuel jetted to the auxiliary intake passages with increasing amount of intake air.

4,501,710

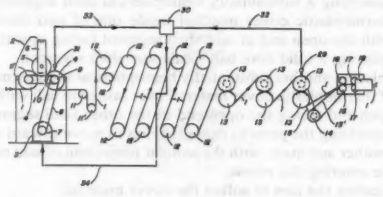
CONTROLLED TOW STRETCHING PROCESS

James G. Abbott; Jerry W. Berley; Allen E. Ward, Jr., and Adolph J. Brandi, Sr., all of Columbia, S.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 897,325, Apr. 18, 1978, abandoned, which is a division of Ser. No. 596,042, Jul. 15, 1975, Pat. No. 4,095,318. This application Jun. 4, 1981, Ser. No. 270,443

Int. Cl.³ D02J *1/22*

U.S. Cl. 264—40.1 **2 Claims**



1. In the process for stretching a tow of filaments by tension on said tow caused by driven rolls dragging said tow across braked drag rolls the improvement comprising

using nip rolls prior to said drag rolls,

sensing variation in a set ratio of speed between at least one driven roll and at least one nip roll, and

continuously controlling at least one nip roll proportional to said sensed variation in ratio of speed.

4,501,711

PROCESS AND COMPOSITION FOR PRODUCING OPEN-CELL CROSS LINKED POLYOLEFIN FILM

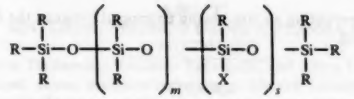
Akitaka Senuma; Yoshihiko Shimizu, and Kiroku Tsukada, all of Yokohama, Japan, assignors to Union Carbide Corporation, Danbury, Conn.

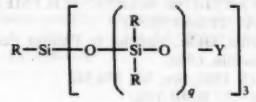
Filed May 15, 1984, Ser. No. 610,593

Int. Cl.³ B29H *7/20*

U.S. Cl. 264—54 **2 Claims**

2. A process for producing open-cell crosslinked polyolefin foam which consists essentially of forming a composition comprising 100 parts by weight of olefin resin, 1 to 20 parts by weight of blowing agent, 0.3 to 10 parts by weight of organic peroxide crosslinking agent and 0.1 to 5 parts by weight of a silicone block copolymer of the formula:





wherein

R is a monofunctional hydrocarbon group;

X is $-(O)_p-(C_nH_{2n}O)_t-R'$

R' is H, alkyl, allyl, aralkyl, or carbamyl group

p is 0 or 1

Y is $(C_nH_{2n}O)_t-R'$

m is 0 to 300

n is 2 to 10

s is 1 to 30

q is 1 to 300

t is 1 to 300

and wherein: $(C_nH_{2n}O)$ is an oxyalkylene radical or mixtures of such radicals. Said organic peroxide having 10 minute half-value temperature (T_p) of 100° C. to 170° C. and said blowing agent having a decomposition temperature (T_f) of 90° C. to 160° C., T_p and T_f satisfying the following equation:

$$-10° \text{ C.} \leqq T_p - T_f \leqq 50° \text{ C.}$$

molding said composition into pellets, powder, film or sheets, and subsequently heating said moldings in a single step.

4,501,712

VACUUM PINNING OF MOLTEN THERMOPLASTIC FILM TO A ROUGHENED CASTING ROLL

David E. Heyer, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

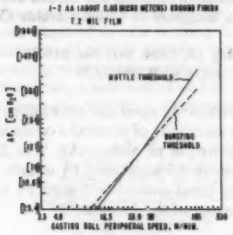
Filed Aug. 20, 1982, Ser. No. 409,877

Int. Cl.³ B29D *7/02*

U.S. Cl. 264—101 **16 Claims**

1. A process for preparing thermoplastic polymeric film comprising extruding a web of said polymeric material in melt form and casting the web onto the surface of a quench roll having a surface roughness of at least three microinches (0.08 micrometers) and yielding a line of contact between the web

and the quench roll while simultaneously applying a vacuum force to the line of contact between the web and the roll



thereby preventing air from being entrapped between the film and the roll.

4,501,713

STABILIZING MELT CRYSTALLIZATION TEMPERATURE IN ARYLENE SULFIDE POLYMER HEAT TREATMENT

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 15, 1983, Ser. No. 504,543
Int. Cl.³ B29B *3/00*
U.S. Cl. 264—176 R **9 Claims**

1. A method for stabilizing the Tmc of PPS subjected to heat treatment in a range up to about 320° C., said method comprising heating said PPS at a rate of temperature increase in a range of at least 20° C. per minute in the range of temperature of between 240° C. and 320° C.

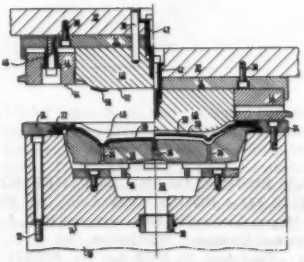
2. A method for stabilizing Tmc in PPS subjected to heat treatment in a range up to about 320° C., said method comprising maintaining the temperature of said PPS at a temperature above at least 350° C. for a time sufficient to stabilize the Tmc.

4,501,714

METHOD FOR MOLDING A CERAMIC ARTICLE

Klaus Strobel, and Klaus Geiger, both of Selb, Fed. Rep. of Germany, assignors to Hutschenreuther Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,302
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207565
Int. Cl.³ B29C *9/00*; B29D *9/00, 31/00*
U.S. Cl. 264—245 **20 Claims**



1. A method of producing a molded article from a ceramic material, such as procelain material, with a design or pattern applied to at least part of the surface of the molded article comprising:

(a) providing a mold, said mold consisting of at least two mold parts (**18, 20; 40**), each of said two mold parts (**18, 20; 40**) having a mold surface, the mold surfaces of said mold parts (**18, 20; 40**) defining a mold cavity;

(b) preforming a design or pattern of decorative material on a transfer carrier (**123**);

(c) transferring said design or pattern to the mold surface of at least one of said mold parts (**18, 20; 40**);

(d) filling said mold cavity with a dry powdered ceramic material,

(e) subjecting said powdered ceramic material within said mold cavity to a molding pressure such as to produce the respective molded article, the pattern or design of decorative material being transferred from said molding surface to said molded article during said pressing step by said molding pressure;

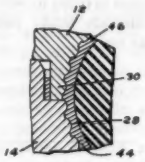
(f) said decorative material being applied to a curved molding surface of a mold part, including the steps of preforming the decorative material onto a planar carrier in a form distorted as compared to the desired design form, and rectifying the distorted design form in transferring the decorative substance from the carrier to the mold part.

4,501,715

MOLD AND METHOD FOR FORMING GOLF BALLS

Gilbert Barfield, 745 Carroll St., Perry, Ga. 31069, and Gary J. Hagopian, 32 Brookmont Dr., Wilbraham, Mass. 01095

Filed May 18, 1983, Ser. No. 495,738
Int. Cl.³ B29D *3/00*
U.S. Cl. 264—248 **11 Claims**



1. A process for compression molding an integral cover for two-piece golf balls, said process comprising:

(a) attaching a pair of telescopically mating male and female dies to a hydraulic press for movement of the dies toward or away from one another in a substantially vertical plane, said male die having a substantially hemispherical mold cavity and an annular projection at the lip of said cavity, said female die having an oppositely facing, annular recess adapted to receive the projection and a substantially hemispherical mold cavity adapted to form a single, spherical mold cavity with said male die cavity when the dies are pushed together;

(b) inserting a substantially hemispherical shell segment of thermoplastic cover material inside one of said cavities with the open end of said shell segment facing upward;

(c) placing a solid core ball inside said shell segment;

(d) placing another substantially hemispherical shell segment of thermoplastic cover material over said core ball with its open end facing the open end of the other shell segment;

(e) operating the press to cause the dies to move toward one another and mate, with the annular projection of said male die entering the recess;

(f) heating the dies to soften the cover material;

(g) trapping extruded cover material from the cavities between the leading edge of the projection and an annular rim in the recess when the projection initially enters the recess;

(h) continuing axial pressure on the dies to fully close the dies together and cause the leading edge of the projection to move closer to the rim and force trapped material to flow back inside the mold cavities to create an integral, spherical cover that is substantially a mirror image of the inside of the mold cavities; and,

(i) draining off excess of the trapped material through a valve during mating of the dies so that the amount of extruded material that is forced back into the mold cavities is substantially only the amount needed to produce a well-shaped cover with a substantially uniform thickness.

8. A mold for compression molding an integral cover for two-piece golf balls, said mold comprising:

(a) a pair of telescopically mating male and female dies which are adapted to be attached to a hydraulic press for movement of the dies toward and away from another;

(b) said male die having a substantially hemispherical mold cavity and an annular piston at the lip of said cavity;

(c) said female die having a recessed area and an adjacent, substantially semispherical mold cavity, wherein the recess is adapted in size and shape to receive the piston when the dies move toward one another and said female mold cavity is adapted in size and shape to form a single, spherical mold cavity with said male cavity when the dies mate, and said female mold cavity is further adapted in size and shape to receive a hemispherical shell of cover stock material and a standard core ball for two-piece golf balls;

(d) wherein said dies include means for trapping extruded cover material from the cavities when the dies are pushed together and for subsequently forcing the trapped material back into the mold cavities to form an integral, spherical cover that is substantially a mirror image of the cavities, said trapping and forcing means comprising a pressure chamber formed by a leading edge of the piston and an annular rim at the bottom of the recess; and,

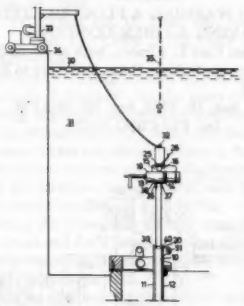
(e) valve means connected with said pressure chamber for draining off excess of the trapped material to insure that the only amount of trapped material transferred back into the cavities is the amount needed to produce a well-formed cover of uniform thickness.

4,501,716

APPARATUS FOR INSPECTING THE INTERIOR OF A REACTOR VESSEL

Alf Engding, Åkersberga, Sweden, assignor to Tekniska Rontgencentralen AB, Stockholm, Sweden

Filed May 11, 1982, Ser. No. 376,998
Claims priority, application Sweden, Sep. 29, 1981, 8105755
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—249 **8 Claims**



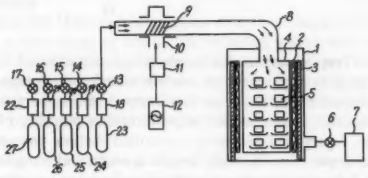
1. An apparatus for inspecting a reactor vessel immersed in a water-filled tank (31), comprising a mast-carriage (2) arranged for movement around an upper opening of the reactor vessel, a mast (9) fixedly connected to the mast-carriage and having first track means (10) extending therealong for an inspection carriage (17) arranged to carry inspection apparatus (19) and provided with drive means (25) for driving said inspection carriage on said first track means, characterized by: a docking unit (21) detachably mounted on an upper end (20) of the mast; second track means (22) on the docking unit connecting with the first track means and having a length such that the inspection carriage can be driven onto the second track means; guide means (36, 37, 39, 40; 64, 65) arranged between the docking unit and the mast for holding the docking unit in a given position relative to the mast; at least two mutually spaced rope means (47, 48) for connecting the docking unit to the mast; a buoyant body (28) arranged on the docking unit for moving the docking unit to the surface (31) of the water in said tank, and means (46, 51; 62, 63) for enabling, during movement of the docking unit to the surface of the water in said tank, an extension of the rope means lying between the docking unit and the mast top, and for generating a tension force by shortening said rope means to cause the docking unit to be returned to the upper end of the mast, wherein the buoyant body comprises a liquid-tight vessel containing a buoyant medium.

4,501,717

SINTERING METHOD USING A PLASMA GAS ATMOSPHERE

Shinya Tsukamoto; Kunihiro Takahashi, and Akira Doi, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 21, 1983, Ser. No. 515,894
Claims priority, application Japan, Jul. 31, 1982, 57-134332
Int. Cl.³ C22B *34/00*
U.S. Cl. 419—58 **14 Claims**



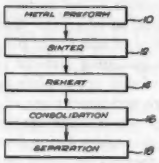
1. In a method which comprises sintering a pressed body of a powder selected from the group consisting of powders to produce cemented carbides, cermets, ceramics and ferrous sintered bodies, the improvement in which a part or all of the sintering process is carried out in a plasma gas atmosphere selected from the group consisting of H_2, N_2, Co, He, Ar and mixtures thereof under a pressure of 0.1 to 50 Torr.

4,501,718

METHOD OF CONSOLIDATING A METALLIC OR CERAMIC BODY

Richard C. Bradt, Bellefonte, Pa., assignor to Metal Alloys, Inc., Signal Hill, Calif.

Filed Feb. 23, 1983, Ser. No. 469,102
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—49 **9 Claims**



1. A method of consolidating a metallic or ceramic body comprising the steps of:

(a) forming an article of manufacture from powdered metal or ceramics;

(b) sintering said article of manufacture so as to increase the strength thereof;

(c) providing a bed of heated, generally spheroidal refractory particles; and

(d) compacting said article of manufacture in said heated bed of generally spheroidal refractory particles under high pressure to thereby consolidate said article of manufacture into a dense, desired shape.

4,501,719

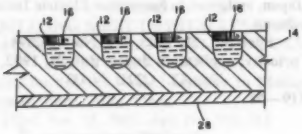
TRAY APPARATUS FOR FREEZE-DRYING BIOLOGICALS HAVING A PREDETERMINED UNIT DOSAGE

Charles D. Williams, Rolling Hills Estate, Calif., assignor to Marquest Medical Products, Inc., Englewood, Colo.

Division of Ser. No. 260,179, May 4, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,862

Int. Cl.³ B01L 3/00; F26B 25/06

U.S. Cl. 422—102 **1 Claim**



1. Tray apparatus for lyophilizing a solution of biological material into pledgets of predetermined unit dosages of the biological material for use in a freeze drying apparatus having a chamber within which is positioned a plurality of spaced apart superposed thermally controlled shelves, comprising:

an upper plate having a length, a width and a thickness and having a plurality of wells extending downwardly from a portion of an upper surface thereof into said upper plate, each of said wells being conical, having downwardly sloping, converging side walls, and terminating in a concave dome shape and having a volume substantially equal to the volume of a solution of the biological material in a liquid, said solution being of such concentration and volume as to yield, upon lyophilization, the predetermined unit dosage size of pledget, each well terminating at a location spaced from a lower continuous surface of said upper plate;

a lower plate having a length, a width and a thickness, an upper continuous surface of said lower plate laminated to said lower continuous surface of said upper plate in a thermally conductive manner, said lower plate comprising a material having a greater thermal conductivity than the material comprising said upper plate;

a sheet of thermal insulating material having a length, a width and a thickness, said thermal insulating material having a continuous lower surface with a surface area substantially equal to or greater than the surface area of said upper surface of said upper plate, said lower surface of said thermal insulating material positioned above said upper surface of said upper plate to establish a thermal gradient through said upper plate wherein lower points in the wells are at lower temperature than upper points in the wells to insure that said solution freezes from the bottom to the top, said thermal insulating material having a lower thermal conductivity than either said upper or lower plates; and,

a separator comprising a continuous rigid sheet positioned between said thermal insulating material and said upper plate, said separator having a lower surface with a surface area substantially equal to or greater than the surface area of said portion of said upper surface of said upper plate from which said plurality of wells extend.

4,501,720

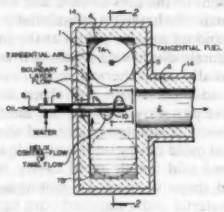
COUNTER-ROTATIONAL FLOW IN A CARBON BLACK REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1982, Ser. No. 391,896

Int. Cl.³ C09C 1/48

U.S. Cl. 422—156 **4 Claims**



1. A carbon black reactor comprising

(a) means defining a cylindrical precombustion zone;

(b) a combustion gas introduction means adapted to tangentially introduce combustion gas into said means defining a cylindrical precombustion zone;

(c) means defining a cylindrical reaction zone in open communication with said means defining a cylindrical precombustion zone; wherein the axis of rotation of said means defining a cylindrical precombustion zone are substantially collinear; and

(d) a helix-shaped fin at least partially within said means defining a cylindrical precombustion zone; wherein the axis of rotation of said helix-shaped fin and the axis of rotation of said means defining a cylindrical precombustion zone are substantially collinear;

(e) a conduit at least partially within said means defining a cylindrical precombustion zone adapted to introduce a feedstock into said carbon black reactor; wherein the axis of rotation of said conduit and the axis of said helix-shaped fin are substantially collinear; and wherein said helix-shaped fin is outside of said conduit.

4,501,721

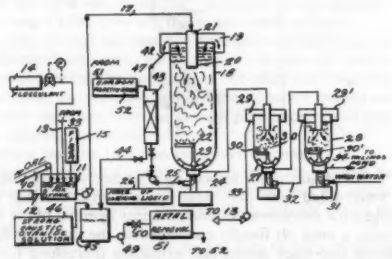
LEACHING AND WASHING A FLOCCULATED SLURRY HAVING A FIBER CONTENT

Michael I. Sherman; Carl L. Elmore, both of Glens Falls, N.Y., and Robert J. Brison, Golden, Colo., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,178

Int. Cl.³ C01G 7/00

U.S. Cl. 423—27 **14 Claims**



1. A method of removing metal from a particlized metal bearing ore, utilizing a treatment vessel, comprising the steps of:

(a) mixing the particlized ore with a liquid to form a liquid

slurry, a flocculating material so as to lock the particlized ore in a stable network in the slurry, and fibers so as to facilitate locking of the particlized ore in a stable network in the slurry;

(b) continuously passing the slurry downwardly in the vessel;

(c) continuously passing a leaching liquid, capable of leaching the metal to be removed from the metal bearing ore, upwardly in the vessel, countercurrent to the slurry passage, to remove metal from the ore in the slurry;

(d) continuously removing the treatment slurry from a bottom portion of the vessel;

(e) continuously removing pregnant leaching liquid, with metal removed from the ore, from a top portion of the vessel; and

(f) continuously washing the slurry removed in step (d).

4,501,722

ABSORPTION OF POLLUTANT MATERIAL FROM A POLLUTED GAS

Michael J. Ashley, Solihull, England; Paul D. Hemphill, Baytown, and Charles C. Leivo, The Woodlands, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 18, 1983, Ser. No. 468,270

Claims priority, application United Kingdom, Feb. 25, 1982, 8205581

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **14 Claims**

1. In a method of absorbing pollutant material comprising sulphur dioxide from a polluted gas containing sulphur dioxide wherein an aqueous suspension of solid absorbent comprising calcium hydroxide or calcium carbonate is sprayed into the gas under ambient conditions in which all the water is evaporated and the absorption product dried as it is formed, the improvement comprising the step of controlling the spray droplet size to be a practical maximum consistent with all said water being evaporated and absorption product dried as it is formed.

4,501,723

METHOD OF MAKING YTTRIUM SILICON OXYNITRIDES

Andre Ezis, Grosse Ile, and Howard D. Blair, Romulus, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01115, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983, PCT Pub. No. WO85/00583, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 19, 1983, Ser. No. 527,643

Int. Cl.³ C04B *35/58*; C01F *17/00*

U.S. Cl. 423—263 **6 Claims**

1. A method of making yttrium silicon oxynitrides according to the formula $Y_aSi_bO_cN_d$, by the steps comprising:

(a) mixing together, in intimate reactive contact, stoichiometric amounts of Y_2O_3, SiO_2, and Si_3N_4 to form a desired yttrium silicon oxynitride where a, b, c, and d represent the required element parts of the compound in equilibrium with the mixture element parts, said SiO_2 may be present as an oxide coating on said Si_3N_4;

(b) heating the mixture in an inert atmosphere to a temperature level and for a time sufficient to convert the stoichiometric amounts of the mixture to the desired yttrium silicon oxynitride; and

(c) grinding said heat agglomerated mixture to a powder.

4,501,724

METHOD FOR THE WET PROCESS MANUFACTURE OF PHOSPHORIC ACID

Walter E. Goers, Briarcliff Manor, N.Y., assignor to Goers Associates Inc., Hawthorne, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,903

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—320 **13 Claims**

1. In the wet process manufacture of phosphoric acid from phosphate rock wherein the phosphate rock is reacted with a concentrated acid reagent to yield concentrated phosphoric acid, the improvement in the process comprising the step of:

reacting the phosphate rock with an effective amount of acid reagent for yielding phosphoric acid wherein said reagent is comprised of a mixture of sulfuric acid and gaseous sulfur trioxide, the gaseous sulfur trioxide being added in an effective amount so as to cause the evaporation of excess water in the feed streams by the release of heat from the reaction between the sulfur trioxide gas and the rock.

4,501,725

PROCESS FOR THE COMBUSTION OF H_2S CONTAINING GASES

Rainer Lell, Kerpen, Fed. Rep. of Germany, assignor to Davy McKee AG, Frankfurt, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,898

Int. Cl.³ C01B *17/02*

U.S. Cl. 423—573 R **8 Claims**

1. A process for the combustion of H_2S containing gases with either air or oxygen or both into elemental sulfur and the separation of the sulfur from the reaction gas, the process comprising:

burning the H_2S containing gases with air or oxygen or both in a load range of 100 to 5% including a high load range and a low load range in a combustion chamber and adjoining reaction chamber, the amount of air or oxygen or both being of sufficient quantity to produce the required ratio of hydrogen sulfide to sulfur dioxide at the exit of the process;

cooling the reaction gas from the reaction chamber in a cooling chamber to condense and separate the sulfur therefrom;

said burning including, in the high load range between 100% and 15% to 40%, burning the H_2S by one or more main burners in the combustion chamber, and, in the low load range between 15% to 40% and 5%, burning the H_2S in a bypass burner in the combustion chamber along with burning a heating gas in the combustion chamber; and

reducing the cooling surfaces in the cooling chamber when burning in the low load range.

4,501,726

INTRAVASCULARLY ADMINISTRABLE, MAGNETICALLY RESPONSIVE NANOSPHERE OR NANOPARTICLE, A PROCESS FOR THE PRODUCTION THEREOF, AND THE USE THEREOF

Ulf Schröder, Fagottgränden 11 B, S-223 68 Lund, and Klaus Mosbach, Lackalänga 31, S-244 02 Furulund, both of Sweden

PCT No. PCT/SE82/00381, § 371 Date Jul. 8, 1983, § 102(e) Date Jul. 8, 1983, PCT Pub. No. WO83/01738, PCT Pub. Date May 26, 1983

PCT Filed Nov. 11, 1982, Ser. No. 522,159

Claims priority, application Sweden, Nov. 12, 1981, 8106723

Int. Cl.³ B01J *13/02*

U.S. Cl. 424—1.1 **8 Claims**

1. A nanosphere or nanoparticle for intravascular administration, which is magnetically responsive and biologically degradable and which is made up of a matrix in which a magnetic material is enclosed, characterized in that said nanosphere or nanoparticle has an average diameter which does not exceed 1500 nm, and circulates in the vascular system after administration thereto, said matrix comprising a hydrophillic, crystalline carbohydrate.

4,501,727

THERAPEUTIC AGENT

Bernard J. Armitage, and Margaret L. Donaldson, both of Nottingham, England, assignors to The Boots Company PLC, Nottingham, England

Filed Dec. 3, 1982, Ser. No. 446,721

Claims priority, application United Kingdom, Dec. 8, 1981, 8136989

Int. Cl.³ A61K *9/44*; C07C *101/10*

U.S. Cl. 424—16 8 Claims

1. The N-methyl-D-glucamine salt of (+)-2-(2-fluoro-4-biphenylyl)propionic acid.

4,501,728

MASKING OF LIPOSOMES FROM RES RECOGNITION

W. Blair Geho, and John R. Lau, both of Wooster, Ohio, assignors to Technology Unlimited, Inc., Wooster, Ohio

Filed Jan. 6, 1983, Ser. No. 456,269

Int. Cl.³ A61K *9/50*, *9/42*, *37/22*

U.S. Cl. 424—38 4 Claims

1. A delivery system consisting essentially of a biochemical membrane containing a drug, hormone, diagnostic or nutritional material covered with sialic acid residues such that the membrane is shielded from the RES thereby providing a coating that masks the surface membrane from recognition by the scavenging cells of the body.

4,501,729

AEROSOLIZED AMILORIDE TREATMENT OF RETAINED PULMONARY SECRETIONS

Richard C. Boucher; John T. Gatzy, and Michael R. Knowles, all of Chapel Hill, N.C., assignors to Research Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,424

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—45 8 Claims

1. A method of removing retained mucus secretions from the lungs of a subject in need of such treatment which comprises delivering an aerosol suspension of amiloride having a particle size within the range of about 3 to 10 microns to the respiratory system of said subject by inhalation of said suspension to thereby achieve concentrations on the airway surfaces of said subject of 10^{-6}M/L–10^{-4}M/L by inhibiting the reabsorption of salt and water from said secretions whereby said secretions are hydrated and are rendered easier to transport from the lung via normal mucociliary mechanisms so that the mucus obstructions are cleared from the airways and respiration is improved.

4,501,730

DEODORANT COMPOSITIONS

Kuniyoshi Torii, and Chikashi Egma, both of Shiga, Japan, assignors to Shiraimatsu Shinyaku Company Ltd., Japan

Continuation of Ser. No. 407,786, Aug. 13, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 621,889

Claims priority, application Japan, Oct. 9, 1981, 56-161796

Int. Cl.³ A61L *13/00*; A61K *35/78*

U.S. Cl. 424—76 3 Claims

1. A deodorant distillate produced by a process which comprises dry-distillation of the leaves of Thea sinensis, said distillate having a boiling point of 180°–200° C. (at 20 mm/Hg) and exhibiting the following properties in a 20 w/w% propylene glycol solution:

Refractive index	$n_D^{20} = 1.418 \pm 0.02$
Angle of optical rotation	$\alpha_D^{20} = 0.007° \pm 0.002°$
Specific gravity	$d_{20}^{20} = 1.025 \pm 0.02$
Ultraviolet absorption maximum peak	276 ± 2 mμ (20 w/w % propylene glycol solution diluted by water in the amount of 1.000 times the weight of said solution).

4,501,731

TREATMENT OF DISPARATE BLEEDING DISORDERS WITH FACTOR X ZYMOGEN

Garson H. Tishkoff, 1850 Abbott Rd., B-10, East Lansing, Mich. 48823, and Douglas W. Estry, 1420 Sunnyside Rd., Lansing, Mich. 48910

Filed Jun. 27, 1983, Ser. No. 508,167

Int. Cl.³ A61K *35/16*

U.S. Cl. 424—101 24 Claims

1. A method for treating mammalian deficiencies of a blood clotting protein which comprises injecting an effective amount of an injectable composition including human factor X zymogen into the blood circulating system of the mammal, wherein the composition is substantially free of activators which convert the factor X zymogen to factor Xa.

4,501,732

SYNERGISTIC ANTIMICROBIAL COMPOSITIONS

Gábor Kulcsár; Gyula Sebestyén; Ágoston Dávid, and Tibor Zilahi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Division of Ser. No. 226,615, Jan. 21, 1981, Pat. No. 4,404,189. This application Jun. 18, 1982, Ser. No. 390,124

Int. Cl.³ A61K *35/00*, *35/74*

U.S. Cl. 424—114 1 Claim

1. A synergistic antibacterial composition which consists essentially of 30–35% by weight of primycin, 30 to 35% by weight of doxycycline or a pharmaceutically acceptable acid addition salt thereof and 30 to 35% by weight of sisomicin along with a pharmaceutically acceptable inert carrier.

4,501,733

POLYPEPTIDES, A PROCESS FOR THEIR PREPARATION, THEIR USE, AND A PROCESS FOR THE PURIFICATION OF POLYPEPTIDES

Joachim Hörig, Stein, and Hartmut Schultheiss, Raisdorf, both of Fed. Rep. of Germany, assignors to Ferring Arzneimittel GmbH, Kiel, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 467,187

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205991

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 514—17 5 Claims

1. Polypeptides of the formula

V-X-D-Trp-Y-D-Trp-Leu-Z-NH_2

wherein V represents Arg, Lys, Orn or Pro, X represents Gln or a single bond, Y represents one of the aminoacids Phe, Ile, Val, Tyr or L-p-Cl-Phe, and Z represents the aminoacids Met or Nle, and salts thereof.

4,501,734

PROMOTION OF ABSORPTION OF DRUGS ADMINISTERED THROUGH THE ALIMENTARY SYSTEM

Osamu Tanaka, and Noboru Yata, both of Hiroshima, Japan, assignors to Wakunaga Yakuhin Kabushiki Kaisha, Japan

Filed Mar. 3, 1982, Ser. No. 354,289

Claims priority, application Japan, Mar. 6, 1981, 56-32012; Sep. 30, 1981, 56-155731

Int. Cl.³ A01N *31/00*, *65/00*

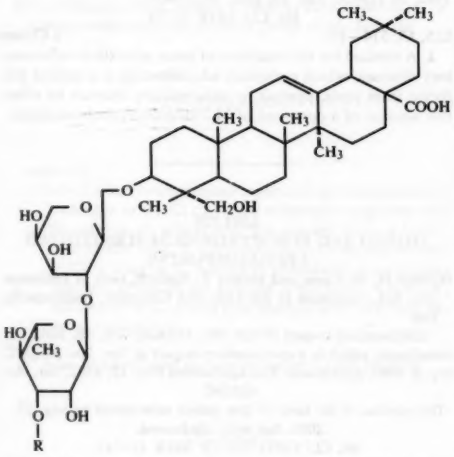
U.S. Cl. 514—198 6 Claims

1. A method for enhancing the absorption by an animal of a β-lactam type antibiotic selected from the group consisting of penicillins and cephalosporins, which comprises orally or rectally administering to an animal in need of said antibiotic the

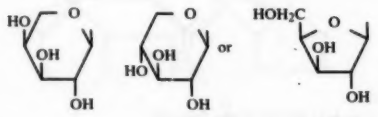
antibiotic and a safe and effective amount of a saponin obtained from a plant selected from the group consisting of:

(a) *Akebia quinata* decne. or plants belonging to the same family (Lardizabalaceae);
(b) *Fatsia japonica* Decne. et Pianch;
(c) *Caulophyllum robustum* Maxim.;
(d) *Hedera rhombea* Bean;
(e) *Clematis chinensis* Osbeck;
(f) *Pulsatilla cernua* Spreng;
(g) *Sapindus mukurossi* Gaertn.;
(h) *Panax japonicum* C. A. Meyer;
(i) *Glycyrrhiza glabra* L.var. glandulifera Regel et Herber, *Glycyrrhiza uralensis* Fisher or plants belonging to the same family (Leguminosae);
(j) *Polygala senega* L. or *Polygala senega* L. var. Latifolia Torrey et Gray;
(k) Platycodon grandiflorum A.D.C.;
(l) *Polygala tenuifolia* Willd.;
(m) *Achyranthes fauriei* Lev. et Van or *Achyranthes bidentata* Blume;
(n) *Cyclamen europaenum;*
(o) *Primula officinalis;*
(p) *Bupleurum falcatum* L. or its varieties (Umbelliferae);
(q) *Panax ginseng* C. A. Meyer;
(r) *Panax notoginseng* Burkill; and
(s) *Panax quinquefolium* L.

5. The method according to claim 1 wherein the saponin is a triterpenoid saponin of the formula



wherein R is



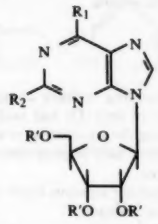
4,501,735

N6-(1- AND 2-BENZOCYCLOALKYL) ADENOSINES

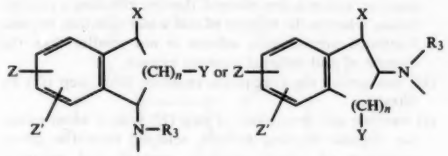
Bharat Trivedi, Canton; Harriet Hamilton, Chelsea, and Walter Moos, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 5, 1983, Ser. No. 558,144
Int. Cl.³ A01N *31/00*; A61K *31/70*; C07H *19/06*
U.S. Cl. 514—46 **16 Claims**

1. A compound of the formula



wherein R_1 is of the formula



in which n is 1; X is hydrogen, lower alkyl or lower alkyl terminally substituted by hydroxy, lower alkoxy or carboxyl, OR where R is hydrogen, lower alkyl, lower alkanoyl or benzoyl, phenyl or phenyl substituted by halogen, hydroxy, lower alkoxy, amino or trifluoromethyl; Y is hydrogen, lower alkyl or lower alkyl terminally substituted by hydroxy, lower alkoxy, or carboxyl, OR where R is hydrogen, lower alkyl, lower alkanoyl or benzoyl; Z and Z′ are independently hydrogen, halogen, nitro, trifluoromethyl, amino, lower alkyl, hydroxy or lower alkoxy; R_3 is hydrogen or lower alkyl; R′ is hydrogen, acetyl or benzoyl; R_2 is hydrogen or halogen; its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,501,736

EXTRACT FROM BARRENWORT

Susumu Mitsuhashi, Musashino; Muneaki Takase, Oizumi; Sosuke Yasui, Tokyo; Ichiro Washizawa, Maebashi, and Kimitomo Yoshioka, Tokyo, all of Japan, assignors to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 258,390, Apr. 28, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,760
Claims priority, application Japan, Apr. 30, 1980, 55-57424; Jun. 20, 1980, 55-83539
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **9 Claims**

1. A process to obtain an extract from barrenwort obtained from plants belonging to the genus Epimedium of the family of Berberidaceae, comprising the steps of

(A) obtaining said barrenwort, and placing said barrenwort in an extraction solvent selected from the group consisting of
(i) a mixture of water and a water-miscible organic solvent selected from the group consisting of lower alcohols, acetone, dioxane, and mixtures thereof,
(ii) water,
(iii) lower aliphatic acids having a concentration lower than one (1) normality,

(iv) water-miscible lower amines at a concentration lower than one mole per liter, and

(v) alkaline hydroxides easily soluble in water having a concentration lower than (1) one normality,

(B) filtering the resulting solution of said barrenwort and said extraction solvent of step (A) to obtain a filtrate,

(C) concentrating said filtrate of step (B) under reduced pressure to obtain an aqueous extract,

(D) adding to said aqueous extract of step (C) an organic defatting solvent selected from the group consisting of

(i) lower aliphatic esters,

(ii) chloroform,

(iii) diethyl ether,

and

(iv) n-hexane,

(E) shaking the resulting mixture comprising said organic defatting solvent of step (D) and said aqueous extract of step (C), collecting the aqueous layer alone, and removing the small amount of said organic defatting solvent left in said aqueous layer,

(F) filtering the resulting aqueous layer of step (E) to obtain a defatted aqueous extract,

(G) adding to said defatted aqueous extract of step (F) a water-miscible, organic fractional precipitation solvent selected from the group consisting of lower alcohols, acetone, and mixtures thereof, thereby effecting a precipitation, wherein the volume of said water-miscible, organic fractional precipitation solvent is not smaller than the volume of said defatted aqueous extract,

(H) recovering the precipitate resulting from step (G) by filtration,

(I) washing said precipitate of step (H) with a water-miscible, organic washing solvent, selected from the group consisting of lower alcohols, acetone and mixtures thereof, wherein the volume of said washing solvent used is about 5 to about 50 times the weight of said washed precipitate,

(J) mixing the resulting washed precipitate of step (I) with a volume of water from about 20 to about 50 times the weight of said washed precipitate,

(K) adding to the solution resulting from step (J) a volume of water-miscible, organic, second fractional precipitation solvent selected from the group consisting of lower alcohols, acetone and mixtures thereof, that is three (3) or more times the volume of the solution resulting from step (J) to effect precipitation,

(L) recovering the precipitate of step (K) by filtration and drying the same to obtain a dry precipitate,

the resulting extract having the following characteristics:

(1) Properties:

(a) Brown powder

(b) Weakly acidic (pH of about 6.5 (when 100 mg of extract is dissolved in 50 ml of water)

(2) Solubility:

(a) Soluble in water

(b) Insoluble in methanol, ethanol, acetone, ethyl acetate, diethyl ether, hexane and chloroform

(3) Color Reactions:

Positive to

(a) anthrone-sulfuric acid reaction,

(b) Bial's reaction,

(c) Molisch's reaction and

(d) skatol reaction;

negative to

(a) ninhydrin reaction,

(b) 2,4-DNP reaction,

(c) Seliwanoff's reaction and

(d) naphthoresorcinol reaction

(4) Saccharides composition: arabinose and galactose

(5) Infrared absorption:

ν_{max}^{KBr}(cm^{-1})3400,1600,1400,1100

(6) U.V. Absorption:

λ_{max}^{H2O}(nm)280,325

4,501,737

PHARMACEUTICAL COMPOSITION CONTAINING 24,25-DIHYDROXYCHOLECALCIFEROL AS AN ACTIVE INGREDIENT TO TREAT MYODYSTROPHIA

Hideyuki Yamato, Tokyo; Noriyuki Toyoda, Sagamihara; Takayoshi Fujii, Tokyo; Yuji Maeda, Nagareyama; Tadaaki Kato, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 620,922

Claims priority, application Japan, Jun. 30, 1983, 58-119427

Int. Cl.[3] **A61K** *31/59*

U.S. Cl. 514—167 **2 Claims**

1. A method for the treatment of myodystrophia, which comprises administering to a patient suffering from myodystrophia an effective amount of a compound of 24,25-dihydroxycholecalciferol.

4,501,738

PHARMACEUTICAL COMPOSITION CONTAINING 24,25-DIHYDROXYCHOLECALCIFEROL AS AN ACTIVE INGREDIENT TO TREAT PAIN, PYREXIA OR INFLAMMATORY DISEASES

Hideyuki Yamato, Tokyo; Yuji Maeda, Nagareyama; Fumisato Yoshino; Kyoya Takahata, both of Tokyo; Masanori Ikuzawa, Tachikawa; Tadaaki Kato, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 620,923

Claims priority, application Japan, Jun. 30, 1983, 58-119423; Jun. 30, 1983, 58-119424; Jun. 30, 1983, 58-119425; Jun. 30, 1983, 58-119426; Jun. 30, 1983, 58-119428

Int. Cl.[3] **A61K** *31/59*

U.S. Cl. 514—167 **2 Claims**

1. A method for the treatment of pains, pyrexia or inflammatory diseases, which comprises administering to a patient suffering from pains, pyroxia or inflammatory diseases an effective amount of a comound of 24,25dihydroxycholecalciferol.

4,501,739

THIENO AND FUROPYRIDINIUM-SUBSTITUTED CEPHALOSPORINS

William H. W. Lunn, and Robert T. Vasileff, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

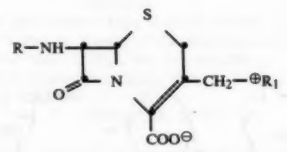
Continuation-in-part of Ser. No. 340,628, Jan. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 300,357, Sep. 8, 1981, abandoned. This application Dec. 15, 1982, Ser. No. 449,945

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.[3] **C07D** *501/38;* **A61K** *31/545*

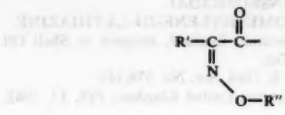
U.S. Cl. 514—203 **51 Claims**

1. The compound of the formula



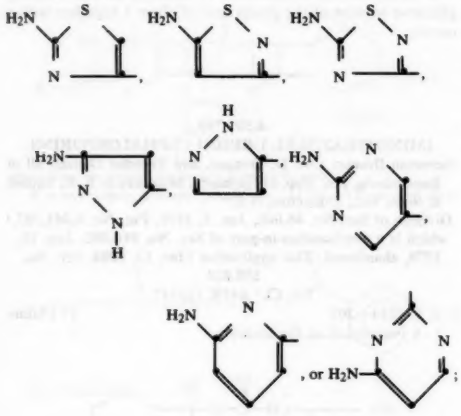
wherein

R is an acyl group of the formula

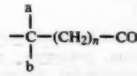


wherein

R' is a 5- or 6-membered heterocyclic ring of the formulas



R'' is hydrogen, C_1–C_4 alkyl, a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula

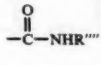


wherein

n is 0–3; a and b when taken separately are independently hydrogen or C_1–C_3 alkyl, and when taken together with the carbon to which they are bonded form a C_3–C_7 carbocyclic ring; R''' is hydroxy, C_1C_4 alkoxy, amino, or OR*, wherein R* is indanyl, phthalidyl, or an acyloxymethyl group of the formula $—CH_2—O—C(O)—R_2$ wherein R_2 is C_1–C_4 alkyl or phenyl; or R* is a carboxy-protecting group;

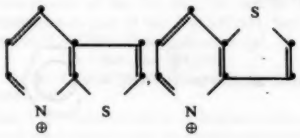
or

R'' is an N-substituted carbamoyl group of the formula



wherein

R'''' is C_1–C_4 alkyl, phenyl or C_1–C_3 alkyl substituted by phenyl; $⊕R_1$ is a bicyclicpyridinium group selected from the group consisting of a thienopyridinium group of the formulas



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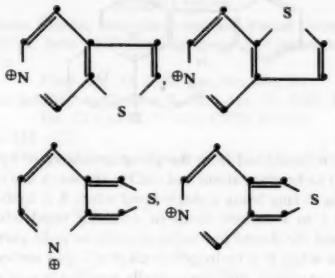
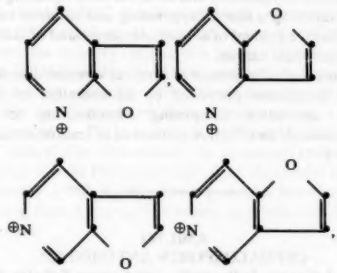
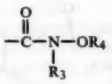


or a furopyridinium group of the formulas



and said thienopyridinium and said furopyridinium wherein either or both of the hetero rings thereof is substituted by one or two C_1–C_4 alkyl, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl groups, $—SO_3H$, hydroxy, C_1–C_4 alkoxy, amino, mono-(C_1–C_4 alkyl)amino, di-(C_1–C_4 alkyl)amino, C_2–C_4 alkanoylamino, aminosulfonyl, cyano, formyl, trifluoromethyl, or a hydroxyamido group of the formula



wherein

R_3 and R_4 independently are hydrogen or C_1–C_4 alkyl; and the pharmaceutically acceptable non-toxic salts thereof.

4,501,740

BLOOD OXYGENATING AND CEREBRAL VASOREGULATING 20,21-DINOREBURNAMENINES

Francois Clemence, Paris; Italo Medici, Bondy; Robert Fournex, Paris, and Colette Tournemine, Livry-Gargan, all of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 21, 1982, Ser. No. 420,791

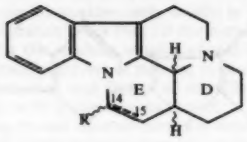
Claims priority, application France, Oct. 8, 1981, 81 18935

Int. Cl.³ A61K *31/435;* C07D *461/00*

U.S. Cl. 514—283 **21 Claims**

1. A compound selected from the group consisting of 20,21-dinoreburnamenines of the formula

I



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and $=CH_2$, the wavy line connecting to the E ring being a single bond when R is hydrogen or alkyl of 1 to 4 carbon atoms or a double bond when R is $=CH_2$ and the dotted line being possibly an endo carbon-carbon bond when R is hydrogen or alkyl of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts in all their possible isomers forms, racemic mixtures and optical isomers.

8. A blood oxygenating and cerebral vasoregulating composition comprising a blood oxygenating and cerebral vasoregulating effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

15. A method of treatment of cerebral vascular disorders and cerebral syndromes provoked by an alteration of cerebral vascular circulation comprising administering to warm-blooded animals an effective amount of at least one compound of claim 1.

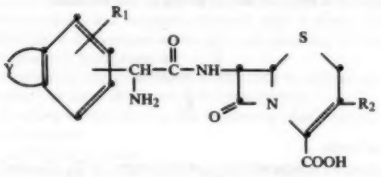
4,501,741

CEPHALOSPORIN ANTIBIOTICS

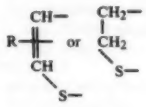
Bernard J. Graves, Indianapolis, and Stjepan Kukolja, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1983, Ser. No. 484,125
Int. Cl.³ C07D *501/22, 501/58*
U.S. Cl. 514—202 **13 Claims**

1. A compound of the formula



wherein Y is



R is hydrogen, C_1–C_3 alkyl, halogen, nitro, amino, C_1–C_4 alkoxy, C_1–C_4 alkanoylamino, or C_1–C_3 alkylsulfonylamino;

R_1 is hydrogen, C_1–C_3 alkyl, halogen, hydroxy, or C_1–C_4 alkoxy;

R_2 is hydrogen, halogen, methoxy or vinyl, and the pharmaceutically acceptable non-toxic salts thereof.

9. A pharmaceutical formulation comprising an antibiotically effective amount of a compound of claim 1 or a pharmaceutically acceptable non-toxic salt thereof and a pharmaceutically carrier.

4,501,742

INSECTICIDAL 3-FORMYL-2-NITROMETHYLENE-2H-1,3-THIAZINE

Martin Harris, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 8, 1984, Ser. No. 578,143
Claims priority, application United Kingdom, Feb. 17, 1983, 8304387
Int. Cl.³ C07D *279/04*; A61K *31/54*
U.S. Cl. 514—226 **6 Claims**

1. 3-formyl-2-nitromethylene-tetrahydro-2H-1,3-thiazine.

3. A insecticidal composition comprising an insecticidally effective amount of the compound of claim 1 together with a carrier.

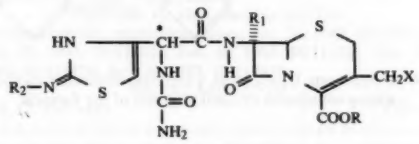
4,501,743

IMINOTHIAZOLYL UREIDO CEPHALOSPORINS

Hermann Breuer; Uwe D. Treuner, and Theodor Denzel, all of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

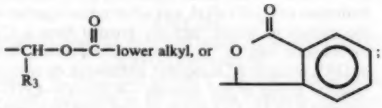
Division of Ser. No. 46,068, Jun. 5, 1979, Pat. No. 4,461,767, which is a continuation-in-part of Ser. No. 916,380, Jun. 16, 1978, abandoned. This application Mar. 12, 1984, Ser. No. 588,831
Int. Cl.³ A61K *31/545*
U.S. Cl. 514—201 **17 Claims**

1. A compound of the formula



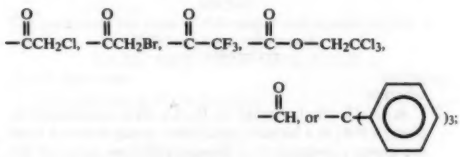
including its amino tautomer from wherein:

R is hydrogen, sodium, potassium, t-butyl, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, trimethylsilyl, —CH_2—O—lower alkyl,



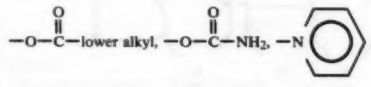
R_1 is in the α-configuration and is hydrogen or methoxy;

R_2 is hydrogen,



R_3 is hydrogen or lower alkyl; and

X is hydrogen,



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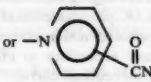
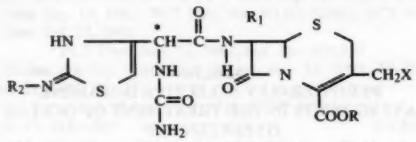
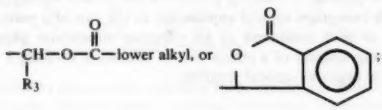


14. An antibacterial pharmaceutical composition comprising a pharmaceutically acceptable carrier and one or more antibacterially active compounds of the formula

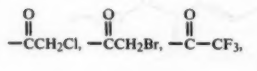


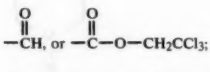
including its amino tautomer form wherein:

R is hydrogen, sodium, potassium, —CH_2—O—lower alkyl,



R_2 is hydrogen,

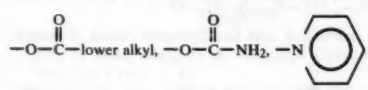


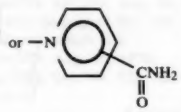


R_1 is in the α-configuration and is hydrogen or methoxy;

R_3 is hydrogen or lower alkyl; and

X is hydrogen,





4,501,744

SUBSTITUTED-AZA-CYTOSINE COMPOUNDS AND ANTI-VIRAL USES THEREOF

Kelvin K. Ogilvie, Candiac, Canada, assignor to ens BIO LOGICALS Inc., Toronto, Canada

Continuation-in-part of Ser. No. 302,790, Sep. 16, 1981, which is a continuation-in-part of Ser. No. 187,631, Sep. 16, 1980, Pat. No. 4,347,360. This application Jul. 28, 1983, Ser. No. 518,196

Int. Cl.³ C07D *251/10;* A61K *31/53*

U.S. Cl. 514—245 **5 Claims**

1. 5-aza-1-[[1-hydroxymethyl-(2-hydroxy)ethoxy]methyl]-cytosine and pharmaceutically acceptable salts thereof.

4,501,745

ANXIOLYTIC IMIDAZO[1,2-a]PYRIDINE DERIVATIVES

Jean-Pierre Kaplan, Bourg-la-Reine, and Pascal George, Vitry sur Seine, both of France, assignors to Synthelabo, Paris, France

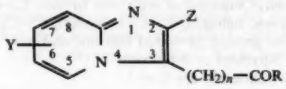
Filed Apr. 13, 1983, Ser. No. 484,591

Claims priority, application France, Apr. 21, 1982, 82 06840

Int. Cl.³ A61K *31/435;* C07D *409/04*

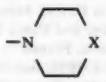
U.S. Cl. 514—222 **9 Claims**

1. An imidazo[1,2-a]pyridine derivative of the formula:



(I)

wherein n represents 2, 3 or 4, Y represents a hydrogen or halogen atom or a C_{1-4} alkyl radical, Z represents a thien-2-yl, furan-2-yl or pyridin-2-yl radical optionally carrying a halogen atom or the methyl or ethyl radical in the 5-position, and R represents the hydroxy radical, or a group —NR_1R_2, in which R_1 and R_2 independently of one another each represent a hydrogen atom; a straight- or branched-chain C_{1-5} alkyl radical optionally carrying one or more halogen atoms, a hydroxy radical, a group —$N(C_{1-4}$ alkyl$)_2$, a carbamoyl radical or a C_{1-4} alkoxy radical; the allyl radical; the propargyl radical; a C_{3-6} cycloalkyl radical; the benzyl radical; or the phenyl radical; or alternatively —NR_1R_2 together represent a heterocyclic ring containing from 3 to 6 carbon atoms, or a heterocyclic ring of the formula



in which X is O, S, CHOR′ or NR″, R′ being a hydrogen atom or the benzyl radical and R″ being a hydrogen atom, a C_{1-4} alkyl radical or the phenyl radical optionally carrying a methoxy radical or a halogen atom, and pharmaceutically-acceptable acid addition salts thereof.

9. A method for the treatment of anxiety states, sleep disorders and other neurological and psychiatric complaints, for the treatment of vigilance disorders, in particular for combating the behavioural disorders which can be attributed to cerebral vascular damage and to the cerebral sclerosis encountered in geriatrics, and also for the treatment of the absences due to cranial traumatisms and for the treatment of metabolic encephalopathies, which comprises administering to a patient with such an ailment an amount of an imidazo[1,2-a]pyridine derivative of the formula depicted in claim 1 or a pharmaceutically-acceptable acid addition salt thereof, sufficient to ameliorate the condition of the patient.

4,501,746

N,N-DISUBSTITUTED CARBOXAMIDE DERIVATIVES, AND FUNGICIDAL USE THEREOF

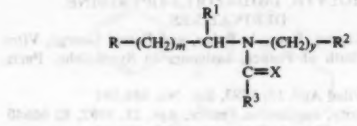
Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 332,022, Dec. 18, 1981, abandoned. This application Sep. 15, 1982, Ser. No. 418,331

Int. Cl.³ A01N *43/40;* C07D *213/56*

U.S. Cl. 514—357 **29 Claims**

1. A compound of the formula



wherein:

R and R^2 independently are 3-pyridyl, 4-pyridyl, C_4–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_8 cycloalkyl, C_1–C_4 alkyl substituted C_3–C_8 cycloalkyl, 3,4-(methylenedioxy)phenyl or phenyl substituted with one or two C_1–C_6 alkyl, C_1–C_6 alkoxy, halogen, C_1–C_6 haloalkyl, C_1–C_6 haloalkoxy or nitro groups; provided that one and only one of R and R^2 is 3-pyridyl or 4-pyridyl;

m and y independently are 0 or 1;

R^1 is H or C_1–C_4 alkyl;

x is O or S;

R^3 is C_4–C_{10} branched alkyl, C_5–C_8 cycloalkyl, -C_1–C_4 alkylene-Z-R^4, wherein

Z is O, S, or a direct link;

R^4 is C_1–C_{10} alkyl, or C_3–C_8 cycloalkyl;

and the agronomically-acceptable salts thereof; with the proviso that when R^4 is C_1–C_{10} alkyl, Z is not a direct link.

23. A method for controlling the growth of fungal diseases which comprises applying to the plant for which control is desired a disease inhibiting and non-herbicidal amount of a compound of claim **1**.

4,501,747

CERTAIN AMIDE DERIVATIVES OF 2-GUANIDINO-THIAZOLES AND COMPOSITIONS CONTAINING SAME

Dino Nisato, Pavia; Sergio Boveri, Monza, both of Italy; Romeo Roncucci, Paris, France, and Paolo Carminati, Milan, Italy, assignors to Sanofi, Paris, France

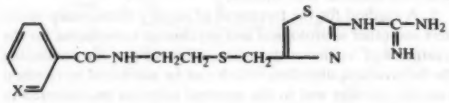
Filed Apr. 29, 1983, Ser. No. 489,723

Claims priority, application France, May 10, 1982, 82 08097; Aug. 13, 1982, 82 14126

Int. Cl.[3] **C07D** *411/12, 263/28;* **A01N** *31/455, 31/42*

U.S. Cl. 514—342 **8 Claims**

1. An amide of formula



in which X represents a N→O or C-NH-A-B group, wherein A represents a CO or SO_2 group and B represents an alkyl group of from 1 to 6 carbon atoms or a phenyl group, or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition having histamine H_2 receptor antagonist action comprising an effective amount of a compound of claim **1**, **2**, **3**, **4**, or **5** as an active ingredient, in combination with an inert pharmaceutically acceptable carrier.

4,501,748

1,4-DIHYDROPYRIDINE DERIVATIVES

Kenji Muto; Akira Karasawa, both of Shizuoka; Tokuyuki Kuroda, Susono, and Nobuhiro Nakamizo, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,181

Claims priority, application Japan, Jun. 3, 1983, 58-98899

Int. Cl.[3] **A61K** *31/445;* **C07D** *211/90, 401/12*

U.S. Cl. 514—318 **4 Claims**

1. An optical isomer having an optical rotation degree of (+) from among (±)-α-2,6-dimethyl-4-(3-nitrophenyl)1,4-dihydropyridine-3,5-dicarboxylic acid-3-(1-benzyl-3-piperidyl) ester-5-methyl ester, the hydrochloride of which has melting points ranging from 196° to 202° C.; or a salt thereof.

4. A pharmaceutical composition which has hypotensive effects and which comprises an effective amount of an optical isomer according to claim **1**, as an active ingredient and a pharmaceutical carrier.

4,501,749

PERIPHERALLY SELECTIVE DOPAMINE ANTAGONISTS IN THE TREATMENT OF OCULAR HYPERTENSION

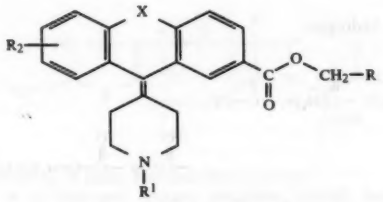
Bradley V. Clineschmidt, Jeffersonville, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 31, 1983, Ser. No. 547,188

Int. Cl.[3] **A61K** *31/33, 31/445*

U.S. Cl. 514—326 **2 Claims**

1. A method of treating glaucoma and ocular hypertension which comprises topical application to the eye of a patient in need of such treatment of an effective intraocular pressure lowering amount of a compound of structural formula I with zero or negative optical rotation:

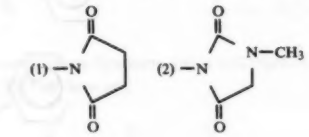


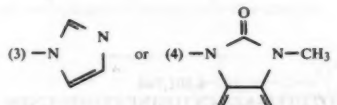
I

or a pharmaceutically acceptable salt thereof, wherein

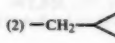
X is (1) —CH=CH—, (2) —CH_2—CH_2—, (3) —CH-2—O—, (4) —O—CH_2—, (5) —CH_2—S—, (6) —S—CH_2—, (7) —S—, or (8) —O—;

R is





R^1 is (1) C_{1-3} alkyl, or



and R^2 is (1) hydrogen, (2) C_{1-3} alkyl, or (3) fluoro.

4,501,750
THIAZOLE COMPOUNDS, A PROCESS FOR PREPARING SAME AND A PHARMACEUTICAL COMPOSITION CONTAINING THE THIAZOLE COMPOUNDS

Isao Sakano; Tatsuro Yokoyama; Seitaro Kajiya, all of Yokohama; Yutaka Okazaki, Mobara; Hiroshi Tokuda, Mobara; Hiroshi Kawazura, Mobara; Mikio Kumakura, Mobara; Takuo Nakano, and Akira Awaya, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Kaguku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00012, § 371 Date Sep. 13, 1982, § 102(e) Date Sep. 13, 1982, PCT Pub. No. WO82/02383, PCT Pub. Date Jul. 22, 1982

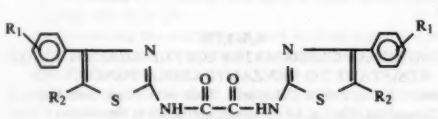
PCT Filed Jan. 13, 1982, Ser. No. 420,257

Claims priority, application Japan, Jan. 13, 1981, 56-2741; Jan. 21, 1981, 56-6231

Int. Cl.³ A01K *31/425;* C07D *417/12*

U.S. Cl. 514—369 9 Claims

1. A thiazole compound of the formula:



(1)

wherein R_1 is a member selected from the group consisting of hydrogen, chloro, bromo, methyl, methoxy, p-phenoxy, p-chlorophenoxy, nitro and cyano, and R_2 is a member selected from the group consisting of hydrogen, and methylthio.

4,501,751
PHENYLETHANOLAMINE DERIVATIVES AND ACID ADDITION SALTS THEREOF FOR ENHANCING THE GROWTH RATE OF MEAT-PRODUCING ANIMALS AND IMPROVING THE EFFICIENCY OF FEED UTILIZATION THEREBY

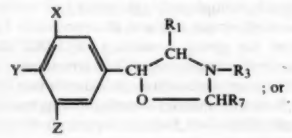
Pamela K. Baker, Hopewell, and Jane A. Kiernan, Kendall Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 219,054, Dec. 22, 1980, Pat. No. 4,404,222, which is a continuation-in-part of Ser. No. 181,254, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 143,069, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,908, Aug. 16, 1979, abandoned. This application Sep. 2, 1983, Ser. No. 528,765

Int. Cl.³ A61K *31/42*

U.S. Cl. 514—374 8 Claims

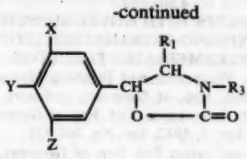
1. A method for increasing the growth rate of meat-producing animals and improving the efficiency of feed utilization comprising: orally or parenterally administering to said animals an effective amount to increase the growth rate of meat producing animals and improve the efficiency of feed utilization of a compound having the structure:



(Ia)

; or

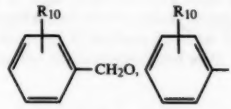
-continued



(Ib)

;

wherein, X is hydrogen, halogen or —CN; Y is hydrogen, NT_8R_9 or $NHCOR_5$; Z is hydrogen, halogen, OH, CN, CF_3, $COOR_1$, $CONH_2$, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, C_1–C_4 dialkylaminomethyl or hydroxymethyl; R_1 is hydrogen or C_1–C_4 alkyl; R_3 is hydrogen, C_1–C_6 alkyl, cyclohexyl, methoxypropyl, C_3–C_4 alkenyl or phenyl; R_5 is hydrogen, C_1–C_4 alkoxy,



≡

or $N(R_1)_2$; R_7 is hydrogen, C_1–C_4 alkyl or phenyl; R_8 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl; R_9 is hydrogen, C_1–C_6 alkyl, C_4–C_6 cycloalkyl, C_3–C_4 alkenyl, or benzyi; and when R_8 and R_9 are taken together with the nitrogen to which they are attached, they represent pyrrolidino; R_{10} is hydrogen, chloro, dichloro, methyl, dimethyl, methoxy, dimethoxy or nitro; with the further provisos that when Y is hydrogen, X and Z are halogen; when R_8 is C_1–C_4 alkyl or C_3–C_4 alkenyl, R_9 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl; when Z is OH, X and Y are hydrogen, that at least one of X, Y, and Z represents a substituent other than hydrogen; and when X is —CN, Z is —CN; when Z is a group other than halogen, Y is NR_8R_9 or $NHCOR_5$; or racemic mixtures of the above-identified compounds, the optically active isomers or non-toxic, pharmacologically acceptable acid addition salts thereof.

4,501,752
ANTIULCER DRUG

Koichi Yokoi, Kashiwa; Koichi Tachibana, Narita; Kazuo Isomae, Narashino, and Toshiaki Nakashima, Shisuimachi, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,829

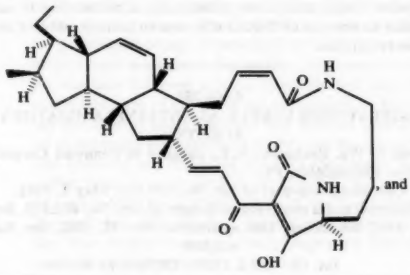
Claims priority, application Japan, Apr. 30, 1982, 57/72960

Int. Cl.³ A61K *31/395*

U.S. Cl. 514—414 16 Claims

1. An antiulcer drug comprising:

(a) an antiulcer effective amount of Ikarugamycin of the following formula:



, and

(b) a pharmaceutical acceptable excipient.

4,501,753

COMBATING PESTS WITH NOVEL SUBSTITUTED CARBAMOYLOXIMINO-TETRAHYDROTHIOPHENES AND INTERMEDIATES THEREFOR

Hans-Ludwig Elbe, Wuppertal, and Ingeborg Hammann, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

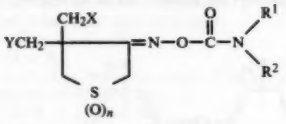
Filed Apr. 5, 1982, Ser. No. 365,929

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116297

Int. Cl.³ A01N *43/02;* **C07D** *333/00*

U.S. Cl. 514—447 **8 Claims**

1. A substituted carbamoyloximino-tetrahydrothiophene, or derivative thereof, of the formula



in which

R^1 represents an alkyl, alkoxyalkyl, alkenyl or alkinyl group,

R^2 represents a hydrogen atom, an alkyl group or a group of the general formula $—SR^3$ or $—S_2R^6$, wherein

R^3 represents an alkyl, halogenoalkyl, optionally substituted phenyl or alkoxycarbonyl group or a grouping of the general formula $—NR^4R^5$, or a radical which is identical to the rest of the molecule to which the group $—SR^3$ is bonded,

R^4 represents an alkyl, alkoxycarbonyl or optionally substituted phenylsulphonyl group,

X represents a hydrogen or halogen atom or a grouping of the general formula $—OR^5$ or $—SR^5$,

Y represents a halogen atom or a grouping of the general formula $—OR^5$ or $—SR^5$,

R^5 represents an alkyl group,

R^6 represents an alkyl group or an optionally substituted phenyl group, and

n is 0, 1 or 2.

4,501,754

METHODS OF TREATING BONE RESORPTION

William J. Wechter, Kalamazoo, Mich., and John E. Horton, Framingham, Mass., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 168,827, Jul. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 73,398, Sep. 7, 1979, abandoned, and Ser. No. 73,400, Sep. 7, 1979, abandoned. This application Mar. 19, 1982, Ser. No. 360,020

Int. Cl.³ A61K *31/35, 31/275*

U.S. Cl. 514—456 **2 Claims**

1. A method of arresting or preventing bone resorption in an animal exhibiting or susceptible to development of bone resorption which comprises systemically administering to said animal an amount of DSCG effective to treat or prevent said bone resorption.

4,501,755

ISOFLAVONES USEFUL AS ANTI-INFLAMMATORY AGENTS

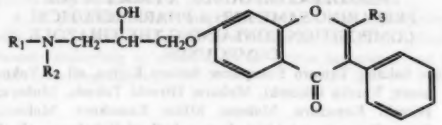
Edwin S. Wu, Rochester, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 259,403, May 1, 1981, abandoned, and a continuation-in-part of Ser. No. 422,929, Sep. 24, 1982, abandoned. This application Nov. 15, 1982, Ser. No. 441,889

Int. Cl.³ A61K *31/35;* **C07D** *311/36*

U.S. Cl. 514—456 **10 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof and where R_1 is hydrogen, lower alkyl or cycloalkyl of up to six carbon atoms, R_2 is hydrogen or methyl and R_3 is hydrogen, lower alkyl, CF_3, cycloalkyl or furyl.

10. A process for treating a warm-blooded animal for inflammation in need of such treatment which comprises administering to such animal an effective amount of the compound of claim **1**.

4,501,756

FUNGICIDAL CARBAMATES USEFUL AGAINST FUNGI RESISTANT TO BENZAMIDAZOLE FUNGICIDES

Toshiro Kato; Junya Takahashi, both of Hyogo, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 28, 1981, Ser. No. 315,860

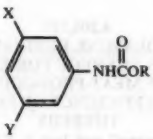
Claims priority, application Japan, Nov. 7, 1980, 55-157237; Nov. 27, 1980, 55-167684; Feb. 13, 1981, 56-20534

Int. Cl.³ A01N *47/20, 43/36, 43/50, 43/52, 57/30*

U.S. Cl. 514—120 **10 Claims**

6. A fungicidal composition comprising:

a fungicidally effective amount effective against fungi which are resistant to benzimidazole fungicides including thiophanate and dicarboximide fungicides of at least one compound of the formula:



wherein X and Y, which are the same or different, are each a lower alkyl group, a lower alkoxy group or a halogen atom and R is a methyl group or an ethyl group;

a fungicidally effective amount of at least one compound selected from the group consisting of benzimidazole fungicides including thiophanate and dicarboximide fungicides; and

an inert carrier.

7. A fungicidal composition according to claim **6**, wherein said benzimidazole fungicide including thiophanate is selected from the group consisting of methyl 1-(butylcarbamoyl)benzimidazol-2-ylcarbamate, 2-(2-furyl)benzimidazole, 2-(4-thiazolyl)benzimidazole, methyl benzimidazol-2-ylcarbamate, 1,2-bis(3-methoxycarbonyl-2-thioureido)benzene, 1,2-bis(3-ethoxycarbonyl-2-thioureido)benzene, 2-(O,S-dimethylphosphorylamino)-1-(3′-methoxycarbonyl-2′-thioureido)benzene, and 2-(O,O-dimethylthiophosphorylamino)-1-(3′-methoxycarbonyl-2′-thioureido)benzene and said dicarboximide fungicide is selected from the group consisting of 3-(3′,5′-dichlorophenyl)-1,2-dimethylcyclopropane-1,2-dicarboximide, 3-(3-,5′-dichlorophenyl)-1-isopropylcarbamoylimidazolidine-2,4-dione, 3-(3′,5′-dichlorophenyl-5-methyl-5-vinyloxazolidine-2,4-dione and ethyl(RS)-3-(3′,5′-dichlorophenyl)-5-methyl-2,4-dioxooxazolidine-5-carboxylate.

4,501,757

YEAST AND DOUGH CONDITION COMPOSITIONS

Don L. Smith, and Shirley J. Smith, both of 1683 E. 6550 S., Salt Lake City, Utah 84121, assignors to Don L. Smith and Shirley J. Smith, both of Salt Lake City, Utah

Filed Feb. 1, 1984, Ser. No. 575,920
Int. Cl.[3] A23L *1/00*; A21D *2/00*
U.S. Cl. 426—62 11 Claims

1. A dough conditioning-yeast quickening composition comprising, in percent by weight, about 0.2–5% fenugreek, 0.1–3% rosemary, 50–75% whey solids, 5–15% lecithin and 5–15% ascorbic acid.

4,501,758

HONEY COATED NUTS

Charles A. Morris, Brooklyn Park, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed May 23, 1983, Ser. No. 497,335
Int. Cl.[3] A23L *1/36, 1/08*
U.S. Cl. 426—93 18 Claims

1. A process for coating nuts with a dried honey product including the steps of:

(a) contacting the nut to be coated with an aqueous mixture of a sugar and a carbohydrate containing adhesive material to coat the nut;

(b) treating the nut of (a) with a dry mixture comprising:

i. from about 50% to about 90% by weight of a sugar;

ii. from about 5% to about 25% by weight of a starch or a dextrine and mixtures thereof; and,

iii. from about 5% to about 25% by weight of a dried honey to sufficiently coat the nuts with a taste effective amount of honey; and,

(c) roasting the nuts;

thereby obtaining the honey coated nuts.

4,501,759

CEREAL PRESWEETENED WITH ASPARTAME AND COLD WATER SOLUBLE GUM COATING AND METHOD OF PREPARATION

Robert J. Gajewski, Crystal, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed May 21, 1982, Ser. No. 380,655
Int. Cl.[3] A23L *1/164*
U.S. Cl. 426—96 9 Claims

1. A sweetened, dry comestible consisting essentially of: a dry comestible, said comestible having a coating, said coating comprising

from about 0.05% to 1.5% by weight of the comestible of a water soluble member selected from the group consisting of sodium alginates, propylene glycol alginates, guar gum, locust bean gum, gum Arabic, pectin, kappa carrageenan, methylcellulose, hydroxypropyl methylcellulose, and mixtures thereof, and

about 0.05% to 0.3% by weight aspartyl-phenylalanine methyl ester, and

wherein the coating is present at from about 0.1% to about 1.8% of the coated comestible.

4,501,760

PRODUCTION OF FAT-CONTAINING PROTEIN FIBERS

Terrence J. Maurice, Colborne, and Jennifer M. Grealy, Gores Landing, both of Canada, assignors to General Foods, Inc., Toronto, Canada

Filed Dec. 23, 1982, Ser. No. 452,746
Int. Cl.[3] A23J *3/00*
U.S. Cl. 426—250 9 Claims

1. A process for the production of protein fibres from a protein source material, which comprises:

(a) forming an aqueous dispersion of protein micelles consisting of amphiphilic protein moieties from at least one vegetable protein source material by solubilization of the protein source material using food grade salt solution and subsequent dilution of the protein solution,

(b) settling said aqueous dispersion of protein micelles to provide an amorphous protein mass containing a substantially undenatured protein isolate having a pH of 5.5 to 5.85, said isolate having substantially no lipid content, substantially no lysinoalanine content and substantially the same lysine content as the storage protein in the protein source material,

(c) separating the amorphous protein mass having a moisture content of about 50 to about 80 wt.% from residual aqueous phase,

(d) admixing the separated amorphous protein mass with an edible vegetable oil under conditions of high shear to form an emulsion containing about 5 to about 20% by weight of the oil,

(e) injecting said emulsion through a plurality of openings of diameter of about 0.005 to about 0.020 inches into water having a pH of about 5.5 to about 7.5 and a temperature of at least about 90° C. to form fibres by coagulation, and

(f) removing the fibres so produced from the hot water.

4,501,761

CONTROLLED COFFEE ROASTING

James P. Mahlmann, Princeton Junction; Steven M. Schecter, Manalapan, both of N.J., and Lawrence Scher, Bronx, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,546
Int. Cl.[3] A23F *5/04*
U.S. Cl. 426—467 5 Claims

1. A continuous coffee roasting method comprising:

(a) continuously charging green coffee beans to the first end of a rotating perforated cylinder, which cylinder is divided into compartments by a helical screw spanning the length of said cylinder;

(b) rotating the perforated cylinder and screw contained therein to advance the coffee completely therethrough in between 2 minutes and 10 minutes;

(c) simultaneously blowing heated gas at a temperature selected from the range between 200° C. and 240° C. upward through the cylinder, along the entire length of said cylinder at a velocity of between 670 m/min and 1250 m/min and at a weight ratio of from about 40/1 to 150/1 said gas to coffee so that the coffee is maintained in a bubbling bed in each said compartment, the temperature of the coffee beans rapidly approaching the temperature of the roasting temperature and being maintained thereat for a combined period of between 2 to 10 minutes until the desired roast is obtained, the bubbling bed condition being intermediate between a static non-fluidized bed where essentially none of the beans are surrounded by the roasting atmosphere and a fluidized bed wherein substantially all of the beans are suspended in the roasting atmosphere, said bubbling bed being one in which the greater mass of coffee beans is suspended in the roasting atmosphere at any given time and a smaller mass of the beans constitute the static bed, whereby heat transfer is promoted causing the bean temperature to closely approach that of the roasting atmosphere; and

(d) continuously withdrawing roasted coffee from the second end of said rotating cylinder.

4,501,762

PROCESS FOR PREPARING ACYL TRIMETHYL CYCLOHEXENE DERIVATIVES AND USE OF INTERMEDIATES THEREFOR IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A CONSUMABLE MATERIAL

Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; John B. Hall, Rumson; Robin Kasper, Eatontown; Manfred H. Vock, Locust; Ronald Schreck, Keyport; Edward J. Granda, Englishtown, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 156,678, Jun. 5, 1980, Pat. No. 4,260,527, which is a division of Ser. No. 88,451, Oct. 26, 1979, Pat. No. 4,250,332. This application Feb. 19, 1981, Ser. No. 235,822
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.
Int. Cl.³ A23L *2/26*
U.S. Cl. 426—538 1 Claim

1. A flavor composition which comprises as active ingredient 1-ethynyl-2,2,6-trimethyl cyclohexanol.

4,501,763

PROCESS FOR PREPARING A SARCOCARP-CONTAINING JELLY

Hiroya Yuguchi, Tokyo; Yoshinobu Hayashi, and Yusuke Miyazaki, both of Kanagawa, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,740
Claims priority, application Japan, Aug. 24, 1982, 57-145500
Int. Cl.³ A23L *1/06*
U.S. Cl. 426—573 14 Claims

1. A process for preparing a sarcocarp-containing jelly having homogeneously dispersed sarcocarps which comprises the step of:

(a) dissolving starting materials for the manufacture of a jelly, other than gelling agents and sarcocarps, in water, to prepare a syrup;

(b) preparing an isotonized mixture (B) comprising isotonized sarcocarps and the syrup, by adding sarcocarps to the syrup to form a mixture (B) and heating the mixture (B) to pasteurize said mixture;

(c) preparing a solution (A), with a specific gravity and in an amount necessary for the preparation of a liquid portion having a specific gravity substantially equal to that of the isotonized sarcocarps contained in the isotonized mixture (B), of a compounded mixture prepared by mixing the solution (A) with the isotonized mixture (B), wherein said solution (A) is prepared by heating an aqueous solution of starting materials containing gelling agents, in the absence of acidic constituents or the sarcocarps, and, wherein the aqueous solution of starting materials has a substantially neutral pH for pasteurization; and

(d) mixing solution (A) with the isotonized mixture (B) at a temperature of not lower than the gelling temperature of the compounded mixture of the solution (A) and the isotonized mixture (B), and rapidly cooling the compounded mixture to solidify said mixture before reisotonizing the sarcocarps contained therein to the osmotic pressure of the liquid portion of the compounded mixture.

4,501,764

MARGARINE FAT BLEND WITH A REDUCED TENDENCY TO SANDINESS

Anne Gercama, Chanteloup les, France, and Robert Schijf, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 19, 1983, Ser. No. 459,175
Claims priority, application United Kingdom, Jan. 20, 1982, 8201578
Int. Cl.³ A23D *5/00*
U.S. Cl. 426—607 17 Claims

1. A margarine fat blend with a reduced tendency to sandiness, defined as a fat blend which does not contain a substantial proportion of needle-like fat crystals with a size ranging from 10 to 50 microns, which fat blend comprises: an oil (a) having a level of linoleic acid residues of at least 20% and a hydrogenated fat (b) having a level of palmitic acid residues of at least 10% obtained by interesterification of a fat (d) having a level of palmitic acid residues ranging from 50 to 90%, with a fat (c) containing trans-fatty acid residues, wherein the ratio of fat (c) to fat (d) ranges from 20:1 to 5:1.

4,501,765

PRODUCTION OF EDIBLE PROTEIN-CONTAINING SUBSTANCES

Peter J. Towersey, High Wycombe; John Longton, Chesham, and Geoffrey N. Cockram, Remenham Hill, all of England, assignors to Ranks Hovis McDougall Ltd., London, England

Continuation of Ser. No. 813,188, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 584,451, Jun. 6, 1975, abandoned, which is a continuation of Ser. No. 440,775, Feb. 8, 1974, Pat. No. 3,937,693. This application Aug. 26, 1982, Ser. No. 411,805
Claims priority, application United Kingdom, Feb. 13, 1973, 7087/73
Int. Cl.³ A23J *3/00*
U.S. Cl. 426—656 17 Claims

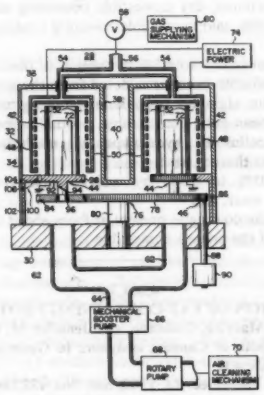
4. An edible protein-containing substance comprising a non-viable edible non-toxic fungal mycelium of a non-toxic strain of *Fusarium graminearum* possessing a reduced level of RNA of below 4%, and being further characterized by improved ease of processing to a form suitable for food use and an essentially white color such as to make the protein-containing substance compatible with food use and a filamentous structure due to the presence of retained fungal cell wall material.

4,501,766

FILM DEPOSITING APPARATUS AND A FILM DEPOSITING METHOD

Katsumi Suzuki, and Shuji Yoshizawa, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 11, 1983, Ser. No. 457,231
Claims priority, application Japan, Feb. 3, 1982, 57-15870; Feb. 3, 1982, 57-15871; Feb. 3, 1982, 57-15877
Int. Cl.³ B05D *3/06;* C23C *13/08*
U.S. Cl. 427—38 18 Claims



1. A film depositing apparatus which deposits a film with a given thickness on each of a plurality of substrates, said apparatus comprising:

a base section;

a casing removably mounted on the base section to form a sealed film depositing chamber;

transfer means for transferring the plurality of substrates in one direction inside the film depositing chamber;

gas supplying means for supplying a material gas into the film depositing chamber of the casing; and

electric discharge means for activating the material gas supplied to the film depositing chamber by the gas supplying means.

15. A method for depositing a film with a given thickness on the surface of each of a plurality of substrates, said method comprising the steps of:

(a) arranging the plurality of substrates on a feed path along a transfer direction;

(b) arranging the internal pressure of a film depositing chamber including an endless transfer path to lead material gas into the film depositing chamber;

(c) causing electric discharge inside the film depositing chamber to activate the material gas;

(d) feeding each of the substrates from the feed path to a predetermined portion of the transfer path in the film depositing chamber through an antechamber;

(e) endlessly driving the substrates in the film depositing chamber along the transfer path to transfer each of the substrates again to the predetermined portion of the transfer path; and

(f) carrying the filmed substrates returned to the predetermined portion of the transfer path to a delivery path via the antechamber.

4,501,767
MULTICOAT FORMING METHOD

Tamio Iimure, Yawata, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

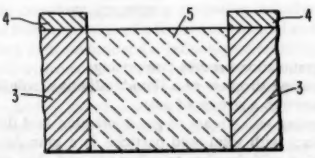
Filed Mar. 28, 1983, Ser. No. 479,250
Claims priority, application Japan, Mar. 30, 1982, 57-51963
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **11 Claims**

1. A method of forming a multicoat coating on a substrate which comprises the steps of applying on said substrate a photocurable colored base coat containing a photocurable film-forming polymer, a photosensitizer capable of photochemically inducing free radical addition polymerization of said photocurable film-forming polymer and a photocuring accelerator which is an unsaturated polymerizable polymer having an aminobenzoyloxy or N-mono or N,N-di-C_1–C_6 alkyl substituted aminobenzoyloxy group; photocuring said base coat; applying a clear top coat on said base coat; and then baking the resulting multicoat at an elevated temperature.

4,501,768
THIN FILM FLOATING ZONE METAL COATING TECHNIQUE

Ananda H. Kumar, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,445
Int. Cl.³ B05D *3/02, 3/12, 5/00*
U.S. Cl. 427—57 **19 Claims**



1. A method of selectively depositing brazeable and solderable coatings over an existing metallurgical pattern of a dielectric substrate, comprising:

sequentially blanket coating said substrate, inclusive of said pattern, with discrete levels of two diverse alloyable metals capable of forming a continuous series of solid solutions and showing a minimum in the liquidus curve in their phase diagram to form brazeable and solderable with the alloys of said metals bondable to said pattern and non-wetting to the bare surfaces of said substrate,

heating said substrate to a temperature below the melting points of said metals and above the lowest liquidus temperature in the phase diagram of the alloy system of said metals, with said heating being maintained for sufficient time to obtain interdiffusion of the component metals to form an alloy composition, at the interface with the substrate, corresponding to the composition of the said lowest liquidus temperature in the phase diagram of the component metals, whereby said alloy of said metals contacts and is bonded to said pattern and dewets the bare surfaces of said substrate to form loosely adhered alloy segments thereon;

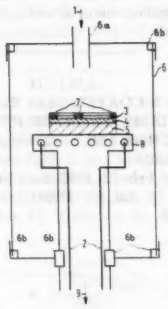
cooling said substrate to solidify said coating and said segments thereon; and

removing said segments from said bare surfaces of said substrate with retention of a brazeable or solderable alloy coating formed on said pattern.

4,501,769
METHOD FOR SELECTIVE DEPOSITION OF LAYER STRUCTURES CONSISTING OF SILICIDES OF HMP METALS ON SILICON SUBSTRATES AND PRODUCTS SO-FORMED

Konrad Hieber, Munich, and Claudia Wieczorek, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,299
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211752
Int. Cl.³ B05D *5/12*; C23C *11/08*
U.S. Cl. 427—95 **11 Claims**



1. A method for selectively depositing layer structures composed of a silicide of a high melting point metal on a substrate surface containing silicon and non-silicon regions, as is particularly used in thin-film and semiconductor technology, by thermal decomposition of gaseous silicon and halogen compounds containing a high melting point metal to produce silicides of such metal and depositing the resultant metal silicide from said gaseous phase onto only the silicon regions of a heated substrate containing silicon and non-silicon regions, said method comprising:

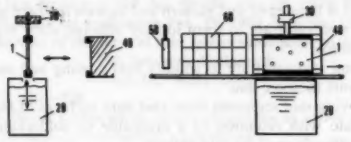
providing a hydrogen halide gas to said reaction gas, said hydrogen halide being selected from the group consisting essential of hydrogen chloride, hydrogen bromide and hydrogen iodine; and

adjusting the substrate temperature and the composition of said reaction gas to respective values at which a nucleation in regions other than on said silicon regions is suppressed during deposition of said metal silicide from such gaseous phase due to the presence of said hydrogen halide.

4,501,770
METHOD FOR REMOVING SOLDER FROM THE DRILL HOLES OF EMPTY PRINTED CIRCUIT BOARDS COATED WITH SOLDER

Imre Bajka, Niederglatt, and Robert Furrer, Zurich, both of Switzerland, assignors to Siemens Aktiengesellschaft Berlin & München, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,642
Claims priority, application Switzerland, Apr. 15, 1981, 2512/81
Int. Cl.³ B05D 3/12, 1/18
U.S. Cl. 427—97 10 Claims



1. A method for the removal of excess solder out of drill holes of a printed circuit board not yet equipped with electrical components, each of the drill holes having an axis and primarily serving to receive and electrically connect the terminals of electric components to metalized conductor tracks on the surface of the printed circuit board, comprising the steps of:

mounting the printed circuit board on a frame;

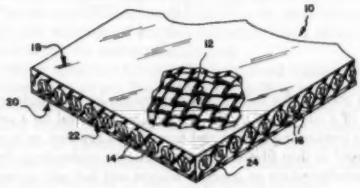
accelerating at least once said frame including the printed circuit board in the direction of the axis of the drill holes while in a condition in which the solder applied to the printed circuit board is still in a molten state; and

after a predetermined travel of the accelerated frame including the printed circuit board bringing to a sudden standstill the accelerated frame including the printed circuit board in a manner such that excess solder is simultaneously propelled-out of all of the drill holes of the printed circuit board.

4,501,771
ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 22, 1982, Ser. No. 350,969
Int. Cl.³ B05D 3/12
U.S. Cl. 427—176 13 Claims



1. The method for manufacturing elastomer-coated bias fabric having one tacky surface for use as a reinforcement material in power transmission belts and the like which comprises:

a. pre-impregnating a bias fabric with an elastomeric latex composition,

b. transversely stretching said pre-impregnated bias fabric,

c. applying a non-carboxylated and non-tackified elastomeric latex composition to both surfaces of said fabric such that said composition substantially penetrates the interstices of said fabric and provides a coating of substantially uniform thickness,

d. Drying said coated fabric to solidify said elastomeric composition,

e. applying to one surface only of said coated fabric a tackified, carboxylated, elastomeric latex composition, and

f. drying said tackified, carboxylated latex composition, to a solid tacky nonflowable state.

4,501,772
PROCESS FOR PRODUCING ULTRA REMOVABLE PRESSURE SENSITIVE LABELS

William P. Luxeder, 4171 Mansfield Ave., Akron, Ohio 44319

Filed Mar. 15, 1984, Ser. No. 589,997
Int. Cl.³ B05D 5/10
U.S. Cl. 427—208.6 4 Claims

1. A method of producing ultra removable paper products having printed matter on at least one surface thereof, comprising the steps of:

(A) printing the printed matter on the selected surface or surfaces of the paper by any conventional printing process;

(B) applying a coating of non-aqueous varnish to both surfaces of the paper;

(C) coating a relief printing plate with a resin bonded fluorocarbon;

(D) heating the plate to the curing temperature of the resin bonded fluorocarbon;

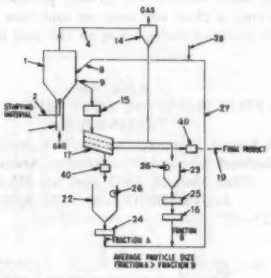
(E) transferring pressure sensitive adhesive from a suitable reservoir to the relief printing plate; and

(F) engaging one surface of the paper with the adhesive so as to transfer a coating of adhesive to the paper.

4,501,773
GRANULATION PROCESS

Susumu Nioh, Tokyo; Hiroshi Hirayama; Tetsuzo Honda, both of Funabashi, and Koji Ishida, Mobara, all of Japan, assignors to Toyo Engineering Corporation and Mitsui Toatsu Chemicals, Inc., both of Tokyo, Japan

Continuation of Ser. No. 191,229, Sep. 26, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,650
Claims priority, application Japan, Oct. 8, 1979, 54-129613
Int. Cl.³ B05D 3/02
U.S. Cl. 427—213 21 Claims



1. A granulation process comprising:

(a) spraying droplets of a liquid, adhesive, solidifiable substance into a stream of gas;

(b) flowing said stream of gas containing said droplets into contact with solid seed particles in a granulator thereby causing said droplets to adhere to and thus enlarge said seed particles;

(c) discharging enlarged seed particles from the granulator:

(d) separating said enlarged seed particles into at least three fractions comprising (i) a final granular product having a range of particle sizes within the desired range, (ii) a smaller granular product having a range of particle sizes smaller than the desired particle size range, and (iii) a

larger granular product having a range of particles sizes larger than the desired particle size range;

(e) continuously feeding said smaller granular product (ii) at a rate independent of the rate at which said smaller granular product (ii) is obtained in step (d) and mixing same with (iv) solid small particles appropriate for use as seed particles in said granulator and having an average particle size smaller than the average particle size of said smaller granular product (ii), thereby forming a mixture;

(f) feeding said mixture into the granulator so that the particles of said mixture serve as solid seed particles in the granulator; and

(g) altering the amount of said solid small particles (iv) mixed with said smaller granular product (ii) in step (e), in response to the average particle size of said enlarged seed particles discharged from the granulator

(1) to reduce the average particle size of said mixture when the average particle size of said enlarged seed particles increases so as to maintain the maximum content of said larger granular product (iii) in said enlarged seed particles below 10 wt. %, and

(2) to increase the average particle size of said mixture when the average particle size of said enlarged seed particles decreases so as to maintain the maximum content of said smaller granular product (ii) in said enlarged seed particles below 75 wt. %,

thereby controlling variations in the average particle size of said enlarged seed particles discharged from the granulator.

4,501,774

PROCESS FOR THE PRODUCTION OF COBALT-CONTAINING MAGNETIC IRON OXIDE POWDER

Kokichi Miyazawa, Suzuka; Kazuo Nakata, Moriyama; Tsuneo Ishikawa, Kawanishi; Ichiro Honma, Moriyama; Masaharu Hirai, Shiga; Makoto Ogasawara, and Toshihiko Kawamura, both of Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Sep. 29, 1982, Ser. No. 427,537

Claims priority, application Japan, Oct. 12, 1981, 56-162554; Aug. 24, 1982, 57-146472

Int. Cl.³ H01F *10/02*; B05D *7/00*

U.S. Cl. 427—215 **12 Claims**

1. In a process for producing a cobalt-containing magnetic iron oxide powder, comprising preparing acicular hydrous iron oxide from a solution of a ferrous compound and an alkali, dehydrating and, subsequently, reducing or reducing and oxidizing said hydrous iron oxide to form an acicular magnetic iron oxide powder, in which a phosphorus compound is present due to adding to either step of preparing said hydrous iron oxide or step of converting said hydrous iron oxide to said iron oxide powder, and then coating the surface of said iron oxide powder with a cobalt compound or a combination of cobalt and another metallic compound or compounds, the improvement comprising, before the coating step, of:

treating said phosphorus-containing iron oxide powder with an aqueous alkaline medium and/or an aqueous acidic medium under atmospheric pressure and recovering the treated iron oxide powder from the medium.

4,501,775

METHOD FOR REDUCING THE STRENGTH OF ICE

Christ F. Parks, and Kenneth H. Nimerick, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 927,227, Jul. 24, 1978, abandoned, which is a continuation of Ser. No. 855,528, Nov. 28, 1977, Pat. No. 4,117,214, which is a continuation-in-part of Ser. No. 380,778, Jul. 19, 1973, abandoned. This application Apr. 14, 1980, Ser. No. 139,906

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ C09K *3/18*; C10K *5/00*; F25C *1/00, 1/12*

U.S. Cl. 427—220 **29 Claims**

1. A method for reducing the strength of ice where

(1) an effective amount of a strength reducing composition is dissolved in the water prior to freezing, said composition consisting essentially of water soluble components comprising (A) an alkylene glycol or monoalkyl ether thereof and (B) a water soluble organic nonvolatile compound having at least one carboxyl or carboxylate group, said compound (B) being different from said compound (A) and being selected from the group of nonpolymeric carboxylic acids comprising up to 10 carbon atoms and their salts, and said composition being substantially free of corrosion inducing metal halide salts, and

(2) the solution so formed is thereafter exposed to a temperature sufficiently low to freeze same.

10. A method for treating particulate solids having surface moisture to reduce the cohesive strength of masses of such solids when frozen, said method consisting of contacting such solids with an effective amount of a fluid composition consisting essentially of water soluble components comprising (A) a water soluble polyhydroxy compound or monoalkyl ethr thereof and (B) a water soluble organic nonvolatile compound having at least one carboxyl or carboxylate group, said compound (B) being different from said compound (A) and being selected from the group of nonpolymeric carboxylic acids comprising up to 10 carbon atoms and their salts, and said composition being substantially free of corrosion-inducing metal halide salts.

4,501,776

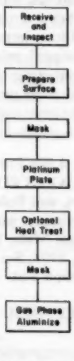
METHODS OF FORMING A PROTECTIVE DIFFUSION LAYER ON NICKEL, COBALT AND IRON BASE ALLOYS

Srinivasan Shankar, Branford, Conn., assignor to Turbine Components Corporation, Brandford, Conn.

Filed Nov. 1, 1982, Ser. No. 437,952

Int. Cl.³ C23C *11/00*

U.S. Cl. 427—253 **15 Claims**



1. A method for forming a protective diffusion layer on selected areas of nickel, cobalt and iron base alloy parts comprising the steps of depositing a coating of a platinum group metal on the surface of the part to be protected and forming a

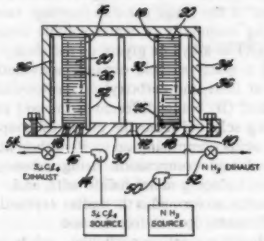
diffusion layer of platinum and aluminum on said surfaces by gas phase aluminizing said surfaces out of contact with a source of aluminizing gaseous species at elevated temperature.

4,501,777

METHOD OF SEALING OF CERAMIC WALL STRUCTURES

Douglas N. Rose, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1982, Ser. No. 421,607
Int. Cl.³ C23C *11/00, 13/00*
U.S. Cl. 427—255 **1 Claim**



1. A method of sealing the pores in a sintered ceramic heat exchanger designed to be used in a hot gas turbine engine, wherein the heat exchanger wall structure is formed of a material selected from silicon nitride and silicon carbide, the heat exchanger wall structure defining two separate flow passages for different gases when the heat exchanger is placed in service:

said method comprising the steps of pumping a first reactant gas into one of the flow passages; pumping a second reactant gas into the other flow passage; maintaining each reactant gas at a sufficient pressure to cause the gases to penetrate into the pores of the heat exchanger walls where they will chemically react to form solid permanent sealing fillers within the pores; and heating the heat exchanger walls while the reactant gases are chemically reacting within the pores; said pumping steps being carried out so that the pressures of the reactant gases are maintained substantially equal during the major part of the time that the chemical reaction is taking place, and the pressures of the reactant gases are selectively varied during the final stages of the reaction to cause one reactant gas to advance further into the porous walls than the other reactant gas; the first reactant gas being a material selected from silicon hydride, silane and silicon tetrachloride; the second reactant gas being a material selected from ammonia and hydrogen; the reactant gases being selected so that the reaction product is the same material as the material originally used to form the heat exchanger wall structure.

4,501,778

METAL EFFECT GLAZES FOR CERAMIC BASES

Rolf Menschner, Frankfurt, and Robert Fischer, Obertshausen, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,132
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316596
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—376.2 **8 Claims**

1. A metal effect glaze composition suitable for applying to a ceramic base consisting essentially of 75–95 of base glaze and 5–25 color body, the base glaze composition consisting essentially of 20–55% PbO, 0.1–10% Na_2O, 1–15% CaO, 1–18% Al_2O_3, and 8–81% SiO_2 and the color body being made of oxides having a composition consisting essentially of 30–80% MnO_2, 1–20% CuO, 0.1–50% TiO_2, and 0.01–20% NiO.

4,501,779

HEAT RESISTANT HEAT SHRINKABLE FILM

Joseph C. Hsu; Donald W. Vought, both of Neenah, and George H. Walbrun, Menasha, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 5, 1981, Ser. No. 308,950
Int. Cl.³ B65D *11/00*; B32B *7/02*
U.S. Cl. 428—35 **4 Claims**

1. A heat shrinkable bag made from a three layer tubular film, the film comprising:

(a) a first heat sealable layer of ionomer;

(b) a second layer of a vinylidene chloride copolymer; and

(c) a third layer of a blend of an ionomer and an EVA copolymer, wherein the EVA content is no greater than 20% of the blend by weight, and the vinyl acetate content is at least 4.5% of the blend by weight.

4,501,780

TUBULAR FILM HAVING SEALING LAYER OF PROPYLENE ETHYLENE RANDOM COPOLYMER

Johnnie J. Walters, Greer, S.C.; Philip T. Voso, Tryon, N.C., and Karl N. Caldwell, Norcross, Ga., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Dec. 15, 1982, Ser. No. 449,895
Int. Cl.³ B65D *65/00*
U.S. Cl. 428—35 **5 Claims**

1. A heat sealable bag made from a coextruded multiply tubular shrink film consisting essentially of:

(a) a first or inner sealing layer which comprises (a) an irradiated, non-cross-linked propylene-ethylene random copolymer having an ethylene content of about 1–5%; and

(b) a second or shrink layer melt bonded to said first layer which comprises a cross-linked ethylene-vinyl acetate copolymer having a vinyl acetate content in the range of 8–25%, further provided that the thickness of said second layer relative to the thickness of said first layer is sufficient such that the shrink temperature of the entire multilayer film, when oriented, is substantially controlled by the shrink temperature of said second layer, and further provided that said second layer has been irradiated to a dosage of 2–10 MR and comprising a blend of ethylene vinyl acetate copolymer as the major component, and the random copolymer of said first layer.

4,501,781

BOTTLE-SHAPED CONTAINER

Hideo Kushida, Yachiyo; Sumio Takahashi, Sakura, and Shuichi Koshio, Koto, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,838
Claims priority, application Japan, Apr. 22, 1982, 57/67780
Int. Cl.³ B65D *23/00*
U.S. Cl. 428—35 **14 Claims**

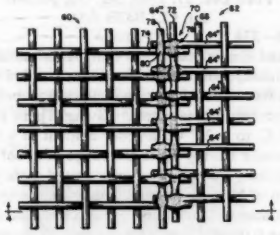
1. A hollow blow-molded biaxially oriented bottle-shaped container comprising a mixture of a polyethylene terephthalate resin and a xylylene group-containing polyamide resin.

4,501,782

METHOD FOR BONDING WEBS EMPLOYING ULTRASONIC ENERGY

Gilbert Weatherly, and A. MacDonald Slade, both of Solano Beach, Calif., assignors to MAC/GIL Ltd., Solano Beach, Calif.

Filed Nov. 18, 1983, Ser. No. 553,149
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—57 **18 Claims**



1. A method for bonding heat-set thermoplastic webs to provide a web loop for use as a Fourdrinier wire for papermaking processes comprising the steps of:

providing a length of heat-set thermoplastic woven web, with the web having two free laterally running ends with warps projecting therefrom;

removing a predetermined number of shutes from each of the ends;

folding the web back on itself to form a loop having a longitudinal axis such that the opposite ends of the web are in spaced-apart opposition;

interdigitating the warps of the opposed ends to form a seam by moving one web end toward the other web end such that a warp extending from one end overlies or underlies at least one shute of the other end; and

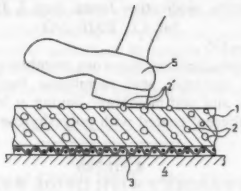
ultrasonically bonding the overlain or underlain shutes to respective warps by placing the web seam between a platten and an ultrasonic welding head and moving the ultrasonic head transversely to the longitudinal axis of the web along the edges containing the interdigitated warps while the face of the welding head exerts a force directed towards the platten on the seam to provide a continuous bond across the web by ultrasonic welding and crushing down the warps over the corresponding shutes, such that a flat seam coplanar with the web is formed, whereby when the web loop is used in a papermaking process, the resulting solidifying sluice is substantially ripple and bump free over the seam and whereby liquid is permitted to pass through the web at the seam.

4,501,783

NON-SLIP FLOOR MATERIAL

Yoshiaki Hiragami, Mino; Mikio Yabu, Kawanishi, and Yozi Kawaguchi, Itami, all of Japan, assignors to Toyo Linoleum Company, Limited, Hyogo, Japan

Filed Jun. 6, 1983, Ser. No. 501,558
Claims priority, application Japan, Jul. 6, 1982, 57-118086
Int. Cl.³ B32B *27/40*; D06N *7/04*
U.S. Cl. 428—147 **10 Claims**



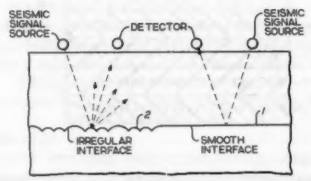
1. A non-slip floor material characterized in that the floor material comprises a polyvinyl chloride matrix surface layer having dispersed therein throughout its entire thickness synthetic resin particles selected from the group consisting of acrylic resin, polyurethane, nylon resin, polyester and ABS resin in an amount of 3 to 30 wt.% of the entire weight of the matrix layer, the resin particles being 100μ to 1 mm in particle size and having a softening point higher than the processing temperature of the resin composition forming the matrix layer and higher abrasion resistance than the matrix layer, a quantity of the resin particles being exposed from the surface of the matrix layer, wherein the difference in abrasion weight loss between the matrix layer and the particles is at least 50 mg and the difference in wear thickness between the matrix layer and the particles is at least 0.01 mm when the floor material is subjected to 1000 cycles of a Taber abraser apparatus at a loading of 500 g on each wheel, the wheels having S-33 sandpaper attached to the surfaces thereof.

4,501,784

DISPERSION OF REFLECTED RADAR

Igor B. Moshinsky, 18703 Candle View, Spring, Tex. 77373

Filed Apr. 5, 1983, Ser. No. 482,176
Int. Cl.³ B32B *3/30*
U.S. Cl. 428—156 **20 Claims**



1. A material of construction for causing a substantial disper-

sion of a radar signal, having a wave length in the short, medium or long range, reflected therefrom,

said material having an external surface with irregularities comprising a plurality of surface portions of different height from the general external surface in spaced relation over the entire exterior surface thereof,

said irregularities having a height R of about 0.2 to about 5.0 times the wave length of the radar signals, and

said irregularities having a spacing approximately 2R of about 0.2 to about 5.0 times the wave length of the radar signals.

4,501,785

HYDROPHILIZED MEMBRANE OF POROUS HYDROPHOBIC MATERIAL AND PROCESS OF PRODUCING SAME

Hikaru Nakanishi, Kawasaki, Japan, assignor to Mitsubishi Rayon Co., Ltd. and Senko Medical Instrument Mfg., Co., Ltd., both of Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,335

Claims priority, application Japan, Aug. 2, 1982, 57-134853

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—195 **9 Claims**

1. A hydrophilized, microporous membrane consisting of a hydrophobic material, said membrane having micropores therethrough, and said membrane having at least a portion of the surfaces thereof coated with polyethylene glycol.

4,501,786

COATED PRODUCT WITH OXIDE WEAR LAYER

Thomas E. Hale, Warren, Mich., assignor to General Electric Company, Detroit, Mich.

Continuation of Ser. No. 331,367, Dec. 16, 1981, abandoned. This application Jan. 25, 1984, Ser. No. 573,867

Int. Cl.³ B24D *11/00*

U.S. Cl. 428—215 **6 Claims**

1. An article of manufacture comprising

(i) a hard metal or cemented carbide substrate;

(ii) an inner layer lying next to said substrate, said inner layer comprising a carbide, a nitride or a carbonitride of titanium, zirconium, hafnium, vanadium, columbium, tantalum, chromium, molybdenum or tungsten

(iii) a surface-oxidized bonding layer adjacent the surface of said inner layer (ii), said bonding layer comprising at least one of the carbides or oxycarbides of tantalum, niobium and vanadium; and

(iv) an oxide wear layer overlying said bonding layer (iii).

4,501,787

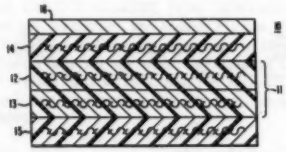
FLAME RETARDANT B-STAGED EPOXY RESIN PREPREGS AND LAMINATES MADE THEREFROM

Joseph R. Marchetti, Hempfield Township, Westmoreland County, Pa., and Wilbur R. Thomas, Hampton, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,098

Int. Cl.³ B32B *7/00, 17/10;* **H05K** *1/00*

U.S. Cl. 428—236 **23 Claims**



1. A porous substrate impregnated with a "B"-staged resin, the resin comprising a mixture of:

(I) a brominated epoxy resin, or

(II) a mixture of (A) a non-halogenated epoxy resin and (B) a flame retarding reactive additive containing bromine and phenolic hydroxyl groups, and

(III) phenolic novolac oligomer curing agent having an average of over 2.5 phenolic hydroxyl groups per oligomeric unit.

4,501,788

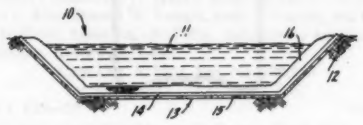
WATERPROOFING SOIL

Arthur J. Clem, Chicago, Ill., assignor to Clem Environmental Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 238,701, Feb. 27, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,685

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—240 **16 Claims**



1. A flexible sheet for providing a water barrier comprising a flexible non-biodegradable support capable of venting gas and coated with water swellable bentonite.

4,501,789

LATEX CONTAINING ODOR INHIBITOR

Pravinchandra K. Shah, Sheffield Lake, and George J. Antlfinger, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 27, 1983, Ser. No. 565,689

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—274 **36 Claims**

1. Sterilized nonwoven fabric that has a reduced odor on sterilization comprising nonwoven fibers bonded with a latex prepared by free radical initiation comprising a preponderance of a soft hydrophobic monomer having Tg in the range of about −80° C. to −20° C., a lesser amount of a hard hydrophobic monomer having Tg in the range of about +40° C. to +120° C., a small amount of an unsaturated carboxylic acid, a small amount of N-alkylol acrylamide or methacrylamide, and a sufficient amount of an emulsifier, said latex having admixed therein about 0.01 to 5 weight parts per 100 weight parts of latex solids of an odor inhibition agent selected from amine-type antioxidants and hindered phenols that have the function of reducing the odor that is generated on sterilization of the nonwoven fabric.

4,501,790

FIBER-REINFORCED URETHANE MOLDING PROVIDED WITH COATING FILMS

Makoto Aizawa; Tsuneo Kishimoto, and Yoshio Tanimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 17, 1984, Ser. No. 631,800

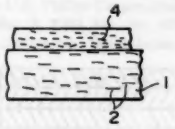
Claims priority, application Japan, Jul. 21, 1983, 58-133655

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—283 **20 Claims**

1. A fiber-reinforced urethane molding provided with coating films, which comprises a molded urethane layer reinforced by inclusion of many reinforcing fibers, and a hard urethane-

based coating film overlaid on the surface of said molded urethane layer, said hard urethane-based coating film containing flake-like aluminum dispersed therein in an amount within the range of 5% by weight to 40% by weight.



4,501,791

NON-WOVEN FABRIC FOR V-BELT BEAD WRAP AND CHAFER

Delbert A. Davis, Kernersville, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 356,398, Mar. 9, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,624

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—286 **9 Claims**

7. A treated non-woven fabric for use in the manufacture of pneumatic tires or V-belts, said treated non-woven fabric being formed by:

applying an isocyanate compound to a non-woven fabric;

drying said non-woven fabric a first time in a heated environment;

applying an adhesive compound to said non-woven fabric;

drying said non-woven fabric a second time in a heated environment; and

impregnating said non-woven fabric with an elastomeric compound, the amount of said elastomeric compound being equal to or greater than 50 percent of the weight of said non-woven fabric.

4,501,792

OPERATING ROOM GOWN AND DRAPE FABRIC

Rory A. Holmes, Princeton, and Eleanor Sun, East Brunswick, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Filed Feb. 3, 1983, Ser. No. 463,459

Int. Cl.³ B32B *5/06*

U.S. Cl. 428—299 **4 Claims**

1. A sterile, low cost, disposable fabric suitable for use in making repellant, breathable, drapes or gowns with enhanced comfort for use in a sterile environment, said fabric comprising cellulosic fibers, and polymeric fibers of 1–2 denier, said fabric further comprising rudimentary discontinuous rows of entangled cellulosic fibers alternating with rudimentary discontinuous rows of loosely entangled polymer fibers, said rows extending in the machine direction, and said fabric having a surface comprising predominantly entangled cellulosic fibers and a surface comprising predominantly entangled polymeric fibers, at least said cellulosic fibers being subject to a repellant treatment, to yield a breathable, repellant soft fabric with enhanced drape and enhanced frictional properties.

4,501,793

SURFACTANT TREATED POLYOLEFINIC MICROPOROUS MATERIALS CAPABLE OF MULTIPLE RE-WETTING WITH AQUEOUS SOLUTIONS

Thyagaraja Sarada, Norwalk, Conn., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,539

Int. Cl.³ B32B *3/26*; D02G *3/00*

U.S. Cl. 428—315.5 **14 Claims**

1. A hydrophilic polyolefinic microporous material comprising a normally hydrophobic polyolefinic open-celled microporous substrate impregnated with at least one nonionic surfactant of the class of alkylphenoxy poly(ethyleneoxy) ethanol compounds having an HLB in the range of from about 10 to about 15 in an amount sufficient to render said hydrophobic polyolefinic microporous substrate wettable with aqueous solutions; said surfactant being present in a solvent mixture comprising from about 55 to about 65 volume percent of methanol or acetone and from about 35 to about 45 volume percent water; and wherein said hydrophobic polyolefinic microporous substrate has a reduced bulk density as compared with the bulk density of a corresponding non-porous polyolefinic material, a crystallinity of at least about 30 percent, an average pore size of from about 100 to about 5000 Angstroms, a porosity of from about 40 to about 90%, and a surface area of at least about 10 m^2/gram.

4,501,794

PHENOLIC FOAM COMPOSITES AND PROCESS FOR MAKING THEM

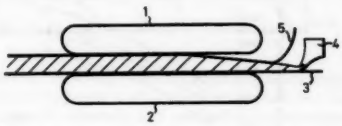
James B. Blackwell, Macclesfield, England; Gerald C. Marks, Cardiff, Wales, and Paul Vereecke, Kortrijk, Belgium, assignors to BP Chemicals Limited, London, England

Filed Jul. 27, 1983, Ser. No. 517,719

Claims priority, application United Kingdom, Jul. 30, 1982, 8222035; Aug. 7, 1982, 8222846

Int. Cl.³ B32B *3/26*

U.S. Cl. 428—316.6 **9 Claims**



1. A phenolic foam composite comprising a sheet of phenolic foam disposed between and bonded to two sheets of flexible insulating material, the thermal conductivity of both of the latter sheets being less than 0.10 W/m°C.

2. A phenolic foam composite which comprises a sheet of phenolic foam disposed between and bonded to two sheets of flexible insulating material comprising polystyrene foam, both of said sheets of polystyrene foam being a thermal conductivity of less than 0.10 W/m°C.

4,501,795

MAGNETIC RECORDING MEDIUM

Takashi Takeuchi; Syoji Kobayashi, both of Utsunomiya; Tsuyoshi Ootani, Ichikaimachi, and Tetsuya Imamura, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,764

Claims priority, application Japan, Mar. 31, 1983, 58-56325

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—329 **9 Claims**

1. A magnetic recording medium comprising a magnetic film coated on a substrate, said magnetic film comprising magnetic particles dispersed in an effective amount of a binder for adhering said magnetic particles to said substrate, said magnetic particles consisting essentially of particles of a magnetic pow-

der (i) coated with a reaction product of (ii) at least one isocyanate compound selected from the group consisting of:

(I) polyisocyanate compounds having at least two isocyanate groups in one molecule and having a molecular weight of 100 to 1,000, and

(II) isocyanate compounds having a hydrolyzable alkoxysilane group and at least one isocyanate group in one molecule and having a molecular weight of 140 to 1,500,

and (iii) at least one phosphoric ester selected from the group consisting of:

(III) phosphoric esters of the formula:

$$(RO)_l PO(OH)_{3-l} \quad (a)$$

wherein R is an alkyl or alkenyl group having 3 to 22 carbon atoms, and l is 1, 1.5 or 2,

(IV) phosphoric esters of the formula:

$$[RO(AO)_n]_l PO(OH)_{3-l} \quad (b)$$

wherein R and l have the same meanings as defined above, A is an alkylene group having 2 to 4 carbon atoms, and n is an integer of from 1 to 30, and

(V) phosphoric esters of the formula:

$$[R'COO(AO)_n]_l PO(OH)_{3-l} \quad (c)$$

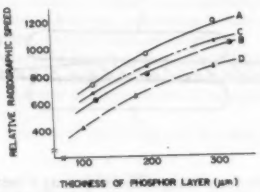
wherein R' is an alkyl or alkenyl group having 2 to 21 carbon atoms, and A, l and n have the same meanings as defined above.

4,501,796

RADIOGRAPHIC INTENSIFYING SCREEN

Akira Kitada, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1983, Ser. No. 511,149
Claims priority, application Japan, Jul. 8, 1982, 57-117779
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—337 **6 Claims**



1. A radiographic intensifying screen comprising a support and at least one phosphor layer provided thereonto wherein said at least one phosphor layer comprises a binder and phosphor particles dispersed therein, and wherein said support is a resin film containing a powdery white pigment in an amount ranging from 0.1 to 10.0 mg/cm², based on the surface area of the support, and said support has a thickness ranging from 100 to 500 μm.

4,501,797

UNBALANCED ORIENTED MULTIPLE LAYER FILM

Scott S. Super; Joseph C. Hsu, both of Neenah; William B. Haffner, Menasha, and Jerry F. Jesse, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

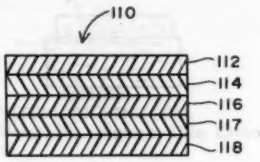
Filed Dec. 1, 1982, Ser. No. 446,009
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—349 **8 Claims**

1. An unbalanced multiple layer polymeric film having two outer surfaces, and wherein the interfacial adhesion at each layer interface is at least 50 grams per inch width, the layers comprising, in order through the film:

(a) a first molecularly oriented layer of polypropylene;

(b) a second molecularly oriented adhesive layer of anhydride modified polypropylene;

(c) a third molecularly oriented layer of ethylene vinyl alcohol copolymer; and



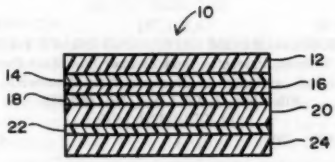
(d) a fourth heat sealable layer; orientation of said film having been accomplished by applying heat to each of said outer surfaces in different amounts, thus creating a temperature differential between said surfaces, and effecting said orientation during the existence of said temperature differential.

4,501,798

UNBALANCED ORIENTED MULTIPLE LAYER FILM

Matthew Koschak, Appleton; Scott S. Super, and Jerry F. Jesse, both of Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed May 5, 1983, Ser. No. 492,016
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—349 **7 Claims**



1. An unbalanced multiple layer polymeric film having two outer surfaces, and wherein the interfacial adhesion at each layer interface is at least 50 grams per inch width, the layers comprising, in order through the film:

(a) a first molecularly oriented layer of nylon;

(b) a second molecularly oriented layer whose composition is selected from the group consisting of nylon, ethylene vinyl alcohol copolymer, and blends of nylon and ethylene vinyl alcohol copolymer;

(c) a third molecularly oriented layer of nylon;

(d) a fourth molecularly oriented polymeric adhesive layer having carboxy moieties in the polymeric structure;

(e) a fifth molecularly oriented layer comprising a polyethylene or a blend of ethylene polymers;

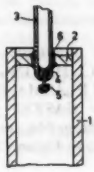
(f) a sixth molecularly oriented polymeric adhesive layer having carboxy moieties in the polymeric structure; and

(g) a seventh heat sealant layer; orientation of said film having been accomplished by applying heat directly to each of said outer surfaces in different amounts, thus creating a temperature differential between said surfaces, and effecting said orientation during the existence of said temperature differential.

4,501,799
COMPOSITE BODY FOR GAS DISCHARGE LAMP

Antonius J. G. C. Driessen; Eise B. Geertsema; Joris J. C. Oomen, and Jan W. Rouwendal, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,964
Claims priority, application Netherlands, Mar. 11, 1981, 8101177
Int. Cl.³ E05C 7/06
U.S. Cl. 428—446 7 Claims



1. A composite body formed from two or more parts, at least one of which consists of an oxidic material, which which oxidic material is bonded to one or more parts of e metallic material or a mixture thereof with a metal oxide (cermet), the oxidic material being chosen from densely sintered aluminum oxide (dga), rare earth perowskites of the types ABO_3 wherein A represents La, Ce, Pr, Nd, or a mixture thereof and B represents: Al, Sc, Lu or a mixture thereof, garnets of the type $A_3Al_5O_{12}$, wherein A is Mg, Li or Y, or sapphire, and the metallic part being chosen from tantalum, niobium, tungsten, molybdenum, alloys having one of these metals as the main component and alloys having iron, nickel or cobalt as the main component, molybdenum-silicon alloys, titanium boride and titanium nitride, which parts are bonded together in a gas and vacuum-tight manner with a bonding material, the bonding material containing aluminum oxide and at least one oxide of a rare earth metal, characterized in that the bonding material consists of a finely dispersed polycrystalline product comprising at least three oxidic components and whose composition is within the following limits in mole %

Al_2O_3—5–70

at least one oxide chosen from Sc_2O_3 and Ti_2O_x, wherein $2<x<4$—2–70

at least one oxide chosen from

Y_2O_3, Gd_2O_3, Tb_2O_3, Dy_2O_3, Ho_2O_3, Er_2O_3, Eu_2O_3, Pr_2O_3, Ce_2O_3, Sm_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3, La_2O_3 and Nd_2O_3—7–80

and one or more oxides chosen from

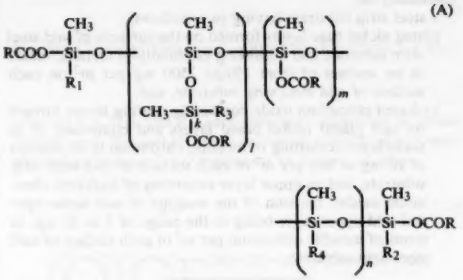
ZrO_2, B_2O_3, SiO_2, P_2O_5, MgO, SrO, BaO and CaO—0–20.

4,501,800
MAGNETIC RECORDING MEDIA COMPRISING ORGANOSILICONES IN A MAGNETIC LAYER THEREOF

Kuniharu Fujiki, Mito, and Shigeru Hashimoto, Tokyo, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Jul. 27, 1983, Ser. No. 517,714
Claims priority, application Japan, Jul. 29, 1982, 57-131153
Int. Cl.³ G11B 5/68, 5/70, 5/72
U.S. Cl. 428—447 5 Claims

1. A magnetic recording medium which comprises a support having thereon a recording magnetic layer which is made of a dispersion of magnetic particles in a mixture of a binder and a lubricant, the lubricant being an organosilicone compound of the following general formula (A)



in which each R represents a saturated or unsaturated monovalent hydrocarbon group having from 7 to 21 carbon atoms, R_1, R_2 and R_3 independently represent a methyl or RCOO group wherein R has the same meaning as defined above, R_4 represents a monovalent saturated hydrocarbon group having from 1 to 20 carbon atoms, and k, l, m and n are independently an integer provided that $1 \leqq k < l+m+n$, $1 \leqq l \leqq 200$, $1 \leqq m < 200$, $0 \leqq n < 300$, and $1+m+n \leqq 500$.

4,501,801
MAGNETIC RECORDING MEDIUM

Shigeo Kimura, Tagajo; Masashi Somezawa, Sendai; Yuji Hinoto, and Hiroshi Yoshioka, both of Annaka, all of Japan, assignors to Sony Corporation and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,040
Claims priority, application Japan, Nov. 19, 1982, 57-204338
Int. Cl.³ G11B 5/68, 5/70, 5/72
U.S. Cl. 428—447 11 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed on at least one side of said non-magnetic substrate, said medium being lubricated by the presence of an effective amount of an organosilane compound represented by the formula:

$$F(CF_2)_p—CH_2CH_2Si(SCOR)_{3-n}$$

wherein R represents a saturated or unsaturated monovalent hydrocarbon residue having from 7 to 21 carbon atoms, n is 0, 1 or 2, and p is an integer from 1 to 12.

4,501,802
HYDRATED CHROMIUM OXIDE-COATED STEEL STRIP USEFUL FOR WELDED CANS AND OTHER CONTAINERS

Seizun Higuchi; Tomonari Ooga; Yukio Tsukamoto; Minoru Kamada, and Yukio Nomura, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 268,115, May 28, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,380
Claims priority, application Japan, Jun. 3, 1980, 55-73795; Jun. 7, 1980, 55-77015; Jun. 7, 1980, 55-77016; Jun. 7, 1980, 55-77017; Aug. 14, 1980, 55-111040; Aug. 14, 1980, 55-111041
Int. Cl.³ C25D 5/36
U.S. Cl. 428—629 5 Claims

1. A can or container having a welded seam and fabricated

from a hydrated chromium oxide-coated steel strip consisting essentially of:

a steel strip substrate having two surfaces;

plated nickel base layers formed on the surfaces of said steel strip substrate and consisting essentially of metallic nickel in an amount of from 150 to 2500 mg per m^2 on each surface of said steel strip substrate, and;

hydrated chromium oxide-containing coating layers formed on said plated nickel based layers and composed of an underlayer consisting of metallic chromium in an amount of 10 mg or less per m^2 of each surface of said steel strip substrate, and an upper layer consisting of hydrated chromium oxides, the sum of the weights of said underlayer and said upper layer being in the range of 2 to 20 mg, in terms of metallic chromium per m^2 of each surface of said steel strip substrate.

4,501,803

POROUS GAS DIFFUSION-ELECTRODE

John G. Bannochie, Versoix, Switzerland, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed Aug. 29, 1983, Ser. No. 527,184

Claims priority, application United Kingdom, Sep. 9, 1982, 8224974

Int. Cl.³ C25F *1/00*; H01M *4/36*

U.S. Cl. 429—101 **8 Claims**

1. A method for conditioning a porous gas-diffusion electrode having ruthenium metal as its predominant electrocatalyst prior to its operation as a hydrogen consuming anode, characterized by connecting the electrode as a cathode in a suitable electrolyte and passing a cathodic current therethrough until said electrode drops below the reversible hydrogen potential and evolves hydrogen.

6. A metal-hydrogen battery comprising a hydrogen-consuming anode in the form of a gas-diffusion electrode conditioned by the method of claim 1.

4,501,804

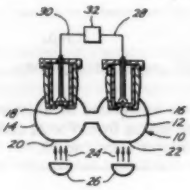
PHOTO-ASSISTED ELECTROLYSIS CELL WITH P-SILICON AND N-SILICON ELECTRODES

John O. Bockris, College Station, Tex.; Marek Szklarczyk, Piaseczno, Poland, and Aliasgar Q. Contractor, College Station, Tex., assignors to Texas A&M University, College Station, Tex.

Filed Aug. 8, 1983, Ser. No. 521,402

Int. Cl.³ H01M *6/36*; C25B *9/00, 11/00*

U.S. Cl. 429—111 **16 Claims**



14. A photoelectric cell comprising:

a container;

an aqueous electrolyte in said container;

a photocathode and a photoanode mounted in said container and each having at least one surface in contact with said electrolyte,

means electrically interconnecting said photocathode and said photoanode; and

means for admitting light to the said surfaces of said photocathode and said photoanode;

said photocathode comprising,

a p-type silicon body and a catalyst on the said surface of said body, said catalyst being selected from the group consisting of nickel, platinum, gold, silver, cobalt, cobalt molybdate and nickel molybdate, and being deposited on said silicon body surface in island form; and

said photoanode comprising,

an n-type silicon body,

a film of silicon dioxide covering the said surface of said n-silicon body; and

an electrically conductive dopant dispersed in said film, said dopant being selected from the group consisting of platinum, palladium, nickel, cobalt, gold, rhodium, ruthenium and tellurium.

4,501,805

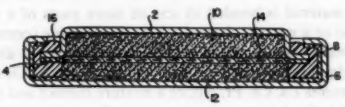
GALVANIC CELL HAVING A SATURATED FLUOROCARBON PLASMA-TREATED SEALING GASKET

Hirotsugu Yasuda, Newburg, Mo., and Johannes A. van Lier, Euclid, Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 22, 1983, Ser. No. 564,250

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—174 **2 Claims**



1. A sealed galvanic cell comprising a cathodic material, an anodic material, and an electrolyte housed in a container having an open end, said container being sealed at its open end by a cover with a non-conductive gasket compressively disposed between said cover and said container, said gasket having a first gasket sealing surface and a second gasket sealing surface, said first gasket sealing surface and said second gasket sealing surface being in interfacial sealing contact with said container and said cover respectively, characterized in that at least a portion of at least one of the first gasket sealing surface and the second gasket sealing surface has only a monolayer of plasma-deposited fluorine atoms bound thereto such that said cell exhibits increased resistance to electrolyte leakage.

4,501,806

METHOD FOR FORMING PATTERN AND PHOTORESIST USED THEREIN

Shingo Watanabe, Himeji, and Takeo Itou, Fukaya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,895

Int. Cl.³ G03C *5/00, 7/26*

U.S. Cl. 430—25 **3 Claims**

1. A method of forming a pattern, comprising the steps of:

(a) forming a photoresist layer of a photoresist containing a water-soluble bisazidocompound, a water-soluble diazocompound, and a water-soluble polymeric material, on an inner surface of a faceplate of a color cathode ray tube, said water-soluble polymeric material being a mixture of polyvinyl pyrrolidone and polyvinyl alcohol in a mixing ratio by weight of polyvinyl pyrrolidone to polyvinyl alcohol within the range of 0.5 to 3, and a mixing ratio by weight of said water-soluble bisazidocompound to said water-soluble diazocompound within the range of 3 to 7;

(b) selectively exposing parts of said photoresist layer using a shadow mask so as to photocure said parts;

(c) developing said photoresist layer to remove unexposed parts of said photoresist layer, thereby forming dots of said photoresist;

(d) forming a film of a non-light-emitting black material on said inner surface of said faceplate including said dots; and

(e) removing said dots and said non-light-emitting black material on said dots so as to form holes in said film of said non-light-emitting black material.

4,501,807

PHOTOCONDUCTIVE MEMBER HAVING AN AMORPHOUS SILICON LAYER

Shigeru Shirai, Yamato; Kyosuke Ogawa, Sakurashin; Junichiro Kanbe, Yokohama; Keishi Saitoh, Tokyo; Yoichi Osato, Yokohama, and Teruo Misumi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,278

Claims priority, application Japan, Mar. 8, 1982, 57-36918; Mar. 8, 1982, 57-36919; Mar. 9, 1982, 57-37437; Mar. 25, 1982, 57-37438; Mar. 25, 1982, 57-47800; Mar. 25, 1982, 57-47801; Mar. 25, 1982, 57-47802; Mar. 25, 1982, 57-47803

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—57 **25 Claims**

1. A photoconductive member comprising a support for a photoconductive member, and an amorphous layer exhibiting photoconductivity comprising an amorphous material containing silicon atoms as a matrix, and at least one of hydrogen atoms and halogen atoms, characterized in that said amorphous layer comprises a first layer region extending throughout the entire thickness of said amorphous layer and containing, as constituent atoms, oxygen atoms in a distribution which is nonuniform and continuous in the direction of the layer thickness, and a second layer region containing, as constituent atoms, the atoms (A) belonging to Group III or Group V of the periodic table in a distribution which is continuous in the direction of the layer region thickness, said second layer existing internally beneath the surface of said amorphous layer.

4,501,808

RECORDING MEDIUM AND PROCESS EMPLOYING A PHOTOSENSITIVE ORGANIC FILM

Kiyoshi Sakai, Mitaka; Shozo Ishikawa, Yokohama; Tetsuo Arita, Shiki; Minoru Mabuchi, and Shoji Umehara, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

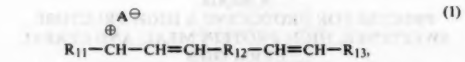
Filed Aug. 25, 1983, Ser. No. 526,533

Claims priority, application Japan, Aug. 30, 1982, 57-150514; Aug. 30, 1982, 57-150515; Aug. 30, 1982, 57-150516; Nov. 5, 1982, 57-194349; Nov. 5, 1982, 57-194350

Int. Cl.³ G03G *5/09*

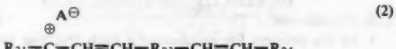
U.S. Cl. 430—59 **56 Claims**

1. An electrophotographic photosensitive member having a conductive substrate and a photosensitive layer which comprises at least one compound of the following formulae (1)–(5), and a binder:



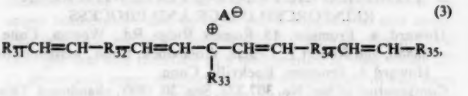
(1)

wherein R_{11} and R_{13} each represent substituted or unsubstituted aryl, R_{12} represents substituted or or unsubstituted arylene, and $A^{\ominus}$ represents an anionic residue;



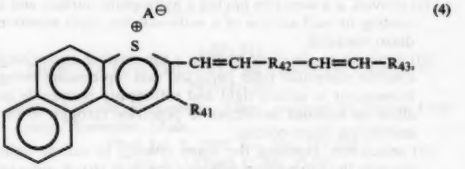
(2)

wherein R_{21}, R_{22}, and R_{24} each represent substituted or unsubstituted aryl, R_{23} represents substituted or unsubstituted arylene, and $A^{\ominus}$ represents an anionic residue;



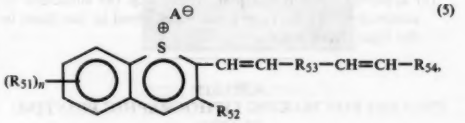
(3)

wherein R_{31}, R_{33}, and R_{35} each represent substituted or unsubstituted aryl, R_{32} and R_{34} each represent substituted or unsubstituted arylene, and $A^{\ominus}$ represents an anionic residue;



(4)

wherein R_{41} represents alkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted styryl, R_{42} represents substituted or unsubstituted arylene, R_{43} represents substituted or unsubstituted aryl, and $A^{\ominus}$ represents an anionic residue; and



(5)

wherein R_{51} represents alkoxy, R_{52} represents alkyl, R_{53} represents substituted or unsubstituted arylene, R_{54} represents substituted or unsubstituted aryl, $A^{\ominus}$ represents an anionic residue, and n represents an integer of 1 or 2.

4,501,809

PHOTOSETTING MICROCAPSULES AND PHOTO- AND PRESSURE-SENSITIVE RECORDING SHEET

Shigetoshi Hiraishi, Tokyo; Sadao Morishita, Ibaraki, and Toshihiko Matsushita, Funabashi, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,280

Claims priority, application Japan, Jul. 17, 1981, 56-111722; Jul. 22, 1981, 56-114620; Jul. 24, 1981, 56-116213; Aug. 3, 1981, 56-121613; Aug. 3, 1981, 56-121614

Int. Cl.³ G03C *1/68, 5/54*

U.S. Cl. 430—138 **15 Claims**

1. A photo- and pressure-sensitive recording sheet which comprises a support having thereon a photo- and pressure-sensitive layer comprising (1) photosetting microcapsules containing principally a photosetting resin, a reactant and a photopolymerization initiator and (2) microcapsules containing a coreactant forming a colored material upon contact with said reactant.

4,501,810
LITHOGRAPHIC PRINTING PLATE WITH RESIN REINFORCED IMAGE AND PROCESS

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Woodstock, Conn., assignors to Howard A. Fromson, Rockville, Conn.

Continuation of Ser. No. 307,335, Sep. 30, 1981, abandoned. This application Mar. 3, 1983, Ser. No. 471,621

Int. Cl.³ G03F *7/02*

U.S. Cl. 430—302 **8 Claims**

1. Process for making a lithographic printing plate which comprises:

(a) providing a substrate having a hydrophilic surface and a coating on said surface of a water-soluble, light sensitive diazo material;

(b) applying to the diazo coating a top coating comprising discrete oleophilic resin particles, said top coating being transparent to actinic light and sufficiently permeable to allow an aqueous developer to penetrate through to the underlying diazo coating;

(c) selectively exposing the diazo coating to actinic light through the top coating whereby the light struck areas of the diazo become water insoluble and selectively adhered in said areas to the hydrophilic surface and the top coating;

(d) removing diazo material and overlying top coating from the non-light struck areas by applying a developer consisting essentially of water and an anionic material to reveal the hydrophilic surface in the non-light struck areas;

(e) applying heat to the plate from step (d) sufficient to coalesce in situ the resin particles adhered to the diazo in the light struck areas.

4,501,811
PROCESS FOR MAKING LITHOGRAPHIC PRINTING PLATES

Masahiko Saikawa; Eiji Kanada; Akira Tanaka, and Kazunaka Endo, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

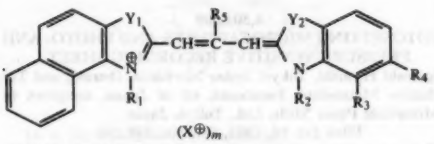
Filed Oct. 13, 1983, Ser. No. 541,656

Claims priority, application Japan, Oct. 16, 1982, 57-181756; Jul. 18, 1983, 58-131388

Int. Cl.³ G03C *5/54, 1/19*

U.S. Cl. 430—204 **9 Claims**

1. A process for making a lithographic printing plate, which comprises imagewise exposing to the radiation from a neon-helium laser or a light-emitting diode a photosensitive element comprising at least emulsion layer of silver halide containing 70 mol-% or more of silver chloride and surface layer containing physical development nuclei, said emulsion layer being spectrally sensitized with an anion- or betaine-type meso-substituted trimethine cyanine dye having at least one β-naphthothiazole nucelus represented by the general formula (I)



(I)

where R_1 and R_2 each represents an alkyl group, an alkenyl group, an aryl group, or an aralkyl group, at least one of R_1 and R_2 is a group having a sulfo or carboxyl group; R_3 and R_4 each represents a hydrogen atom, an alkyl group, an alkoxy group, an aryl group, a hydroxyl group, an alkoxycarbonyl group, or a halogen atom, R_3 and R_4 may jointly form a benzene ring; R_5 represents an alkyl group, an aryl group, or an aralkyl group; Y_1 and Y_2 each represents a sulfur or selenium atom, provided that Y_1 and Y_2 are not simultaneously a selenium atom; X represents a cationic form of a hydrogen atom, an alkali metal atom, or an ammonium group; and m is 1 or 0, and developing the exposed element by the silver complex diffusion transfer process.

4,501,812
PHOTOGRAPHIC COLOR DEVELOPER COMPOSITION PACKAGED IN TWO OR MORE CONCENTRATED PARTS, PARTICULARLY SOLUTIONS, AND CONCENTRATED COLOR DEVELOPER WATER SOLUTION

Carlo Marchesano, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 2, 1984, Ser. No. 576,349

Claims priority, application Italy, Feb. 10, 1983, 65203 A/83

Int. Cl.³ G03C *5/30, 7/30, 5/24*

U.S. Cl. 430—466 **12 Claims**

1. A photographic color developer composition packaged in two or more concentrated parts, such that on mixing with water the parts, form a ready-for-use silver halide color developer solution, one part thereof consisting of an aqueous concentrated solution containing an N-hydroxyalkyl-substituted p-phenylene diamine salt developing agent and a sulfite compound as antioxidant, characterized by the fact that said aqueous concentrated solution has a pH from 6 to 8.

4,501,813
BIOLUMINESCENCE METHOD FOR DETERMINING NADH OR NADPH

Timo Lövgren, Vallaojantie, and Jukka Lavi, Karjatie, both of Finland, assignors to Wallac OY, Turku, Finland

Filed Jun. 21, 1982, Ser. No. 390,710

Claims priority, application Sweden, Jun. 25, 1981, 8103980

Int. Cl.³ C12Q *1/66, 1/26;* C12N *9/96*

U.S. Cl. 435—8 **5 Claims**

1. Method for determining NADH-concentration and/or NADPH-concentration in sample, comprising contacting the sample with a bioluminescent reagent based on bacterial luciferase, NAD(P)H-FMN oxidoreductase, FMN and aliphatic aldehyde, whereby a reaction takes place, where NAD(P)H is oxidized and FMN is reduced, the reaction being catalyzed by the oxidoreductase, whereafter the $FMNH_2$ formed thereby and the aldehyde are bound to the luciferase and light is emitted, the intensity of such light being measured and constituting a measure of the NADH-concentration or NADPH-concentration, characterized in that the bacterial luciferase is used in combination with an amount of oxidoreductase which consumes a negligible amount of NADH or NADPH in the sample so that a constant light intensity is obtained in the presence of a constant amount of NADH or NADPH, the amount of NAD(P)H-FMN oxidoreductase per analysis being 0.2 to 20 mU, wherein U is the amount of enzyme catalyzing the oxidation of 1 μmol of NADH or NADPH per minute, and the amount of bacterial luciferase per analysis being 0.8 to 80 ug.

4,501,814
PROCESS FOR PRODUCING A HIGH FRUCTOSE SWEETENER, HIGH PROTEIN MEAL, AND CEREAL GERM OILS

Karlheinz W. R. Schoenrock, Ogden, Utah; Thomas H. Henscheid, Twin Falls, Id., and Hugh G. Rounds, Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Division of Ser. No. 955,092, Oct. 26, 1978, Pat. No. 4,247,636. This application Jul. 21, 1980, Ser. No. 170,642

Int. Cl.³ C12P *19/24, 19/20, 19/14*

U.S. Cl. 435—94 **7 Claims**

1. In the process for producing a high fructose sweetener from an impure starch flour including subjecting a slurry of said flour to enzymatic degradation in a sequence of stages to first liquify the starch and to then saccharify and purify said liquified starch, the improvement which comprises removing substantially all undissolved matter from said slurry subsequent to initiation of the saccharification stage but prior to complete

saccharification of said liquified starch thereby to produce a said high fructose sweetener lower in color than is obtainable by subjecting the same said slurry to a similar procedure wherein substantially all of said undissolved matter is removed either before the initiation of or following completion of said saccharification stage.

4,501,815

ARTICLE FOR CULTURING DIFFERENTIATED CELLS

Lola C. M. Reid, Rye, N.Y., and Marcos Rojkind, Ciudad Satelite, Mexico, assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 89,167, Oct. 29, 1979, Pat. No. 4,352,887. This application Jun. 25, 1982, Ser. No. 392,323

Int. Cl.³ C12M *3/00, 3/04*

U.S. Cl. 435—284 8 Claims

1. A cell culture environment consisting essentially of a base support for containing culture medium and said cells cultured thereon and a plurality of connective tissue-derived fibers in suspension within a solution conducive to culturing cells and within said base support, said connective tissue-derived fibers consisting essentially of collagens, non-collagenous proteins and carbohydrates.

4,501,816

METHOD OF DETERMINING IMMUNOGLOBULIN LEVELS IN MAMMALS

Aberra Molla, 6700 E. Montview Blvd., Denver, Colo. 80207

Filed Sep. 30, 1982, Ser. No. 429,044

Int. Cl.³ G01N *33/50, 33/68, 21/82*

U.S. Cl. 436—34 12 Claims

1. A method of determining immunoglobulin levels in the body fluids of a mammal, said method comprising:

(a) forming a reaction mixture of a body fluid and an aldehyde wherein the concentration of said aldehyde by weight to body fluid by volume is in excess of about 6.25 mg/ml and wherein said aldehyde is effective as a gelling agent;

(b) determining the positive gelling time; and

(c) comparing the positive gelling time of the reaction mixture to a known positive gelling time of a known mixture of the same aldehyde and body fluid containing a known quantity of an immunoglobulin.

4,501,817

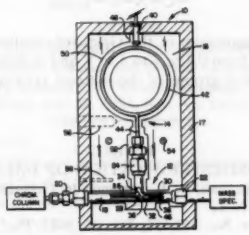
METHOD FOR THE ANALYSIS OF MATERIALS BY CHROMATOGRAPHY AND MASS SPECTROMETRY

Brian D. Andresen, and Kwokei J. Ng, both of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Division of Ser. No. 306,942, Sep. 30, 1981, Pat. No. 4,391,778. This application May 4, 1983, Ser. No. 491,532

Int. Cl.³ G01N *31/08;* H01J *27/00*

U.S. Cl. 436—161 6 Claims



1. In a method for the analysis of a mixture of chromatography of said mixture on a gas chromatography column and passing the output from said column via an open-split interface into a mass spectrometer having a total ionization monitor, wherein the temperature of said column is progressively increased during said analysis from a lower temperature to an upper temperature and an inert gas is supplied to said open-split interface, the improvement which comprises heating said inert gas and said interface to a temperature at least about 10° C. above said upper temperature, the temperature of said inert gas and said interface being maintained substantially constant as the temperature of said column is progressively increased, thereby preventing drift in the base line signal of said total ionization monitor of said mass spectrometer as the temperature of said column is progressively increased.

4,501,818

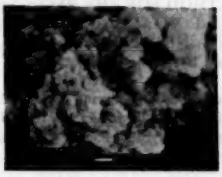
PROCESS FOR THE PREPARATION OF CERAMIC POWDERS

Giulio A. Rossi, Shrewsbury, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jul. 5, 1983, Ser. No. 511,058

Int. Cl.³ C04B *35/00, 35/48*

U.S. Cl. 501—1 14 Claims



Scanning electron photomicrograph (SEM) of zirconia powder containing 5.4 w/o yttrium oxide, prepared according to the present invention, dried in oven at 105°C.

1. A process for the preparation of uniform, sub-micron size sinterable metal oxide ceramic powders, comprising the steps of:

(a) forming a substantially anhydrous first solution of salts of all the metals whose oxides are present in said metal oxide ceramic powders in the proportions present therein and forming a substantially anhydrous second solution of alkali metal hydroxides in the amount stoichiometrically required to react with the metal content of said first solution;

(b) adding said first solution to said second solution, so as to form without evidence of gellation a solid precipitate containing substantially all the ceramic metal content originally in said first solution;

(c) separating said solid precipitate from the bulk of its supernatant liquid;

(d) heating said solid precipitate to remove residual solvent;

(e) washing said solid precipitate with water sufficiently to remove substantially all water-soluble salts therefrom; and

(f) drying said washed solid precipitate at a temperature in excess of the boiling point of water.

4,501,819

GLASS FOR A PHOTOMASK

Hisao Yatsuda, and Mutsumi Miyazaki, both of Sagamihara, Japan, assignors to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho, Kanagawa, Japan

Filed Dec. 15, 1983, Ser. No. 561,750

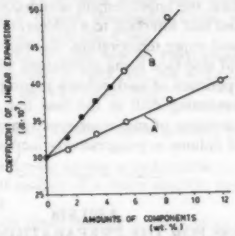
Claims priority, application Japan, Dec. 23, 1982, 57-224957; Sep. 26, 1983, 58-176477

Int. Cl.³ C03C *3/08, 3/10*

U.S. Cl. 501—61 1 Claim

1. Glass for a photomask consisting, in weight percent, of 45 to 60% SiO_2, 0.5 to 12% B_2O_3, 10 to 22% Al_2O_3, 5 to 17% MgO, 0 to 5% CaO, 0 to 8% SRO, 1.5 to 15% BaO, 1.5 to 17%

ZnO, 0.5 to 10% PbO, the total content of ZnO and PbO being at least 6%, 0 to 7% $Ta_2O_5+Nb_2O_5+La_2O_3+Gd_2O_3$.



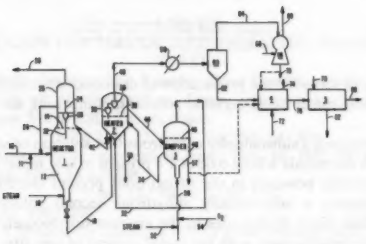
$+Y_2O_3+Bi_2O_3+WO_3$, 0 to 5% ZrO_2+TiO_2, 0 to 2.5% $Na_2O+K_2O+Li_2O$, 0 to 0.5% As_2O_3 and 0 to 0.5% Sb_2O_3.

4,501,820

METHOD FOR THE RECOVERY OF A TUNGSTEN-CONTAINING CATALYST FROM COKE CONTAINING NICKEL AND VANADIUM

David E. Allan; Byron V. Molstedt, both of Baton Rouge, La., and Raam R. Mohan, Berkeley Heights, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 28, 1983, Ser. No. 518,026
Int. Cl.³ B01J *23/92*; C10G *11/04*
U.S. Cl. 502—27 **8 Claims**



1. A method of recovering a catalyst comprising a tungsten component from solids comprising said catalyst associated with coke comprising metallic components, including nickel and vanadium, said catalyst having become associated with said coke in a coking process conducted in the presence of said catalyst, which comprises the steps of:

(a) contacting said solids with a gas comprising steam at a temperature ranging from about 1600° F. to about 2000° F. to gasify partialy said coke;

(b) heating the resulting solids at a temperature below the fusion point of said metallic components, said temperature being no greater than about 1100° F. in the presence of a molecular oxygen-containing gas for a time sufficient to remove at least a portion of the coke from said solids;

(c) contacting the solids resulting from step (b) in an extraction zone with an extractant comprising nitric acid at a temperature ranging from about 70° to about 250° F., at an acid strength ranging from about 0.2 normal to about 12 normal, to remove selectively said nickel and said vanadium from said solids, and

(d) recovering said catalyst comprising said tungsten component.

7. The method of claim 1 wherein said extractant additionally comprises H_2O_2.

8. The method of claim 1 wherein said extractant comprises an acid having a strength ranging from about 0.2 normal to 1.0 normal.

4,501,821

PROPERTY ENHANCEMENT OF ANIONICALLY POLYMERIZED NYLON WITH DUAL INITIATORS

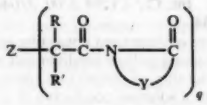
Robert B. Hodek, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1983, Ser. No. 518,161
Int. Cl.³ C08F *4/50*
U.S. Cl. 502—155 **10 Claims**

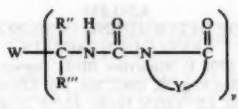
1. A catalyst and initiator composition for lactam polymerization, comprising:

A. an initiator system comprised of

(a) at least one material represented by the following structural formula:

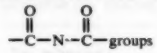


(b) at least one material represented by the following structural formula:



wherein q and v are independently an integer of at least 1; Z and W are independently selected from a compound or polymeric material, said compound being composed of at least two elements in chemical combination which contain up to two repeating structural units, said polymeric material being a macromolecule formed by the chemical union of at least two coreactants and having at least three repeating structural units; with the proviso that at least a portion of either or both the materials (a) or (b) is a polymeric material; R, R', R'', R''' are independently hydrogen, a C_1 to C_{10} aliphatic radical, C_3 to C_{10} cycloaliphatic radical, C_6 to C_{10} aryl or alkaryl radical, and independently R and R'' and the carbon to which each is attached are included as part of a cycloaliphatic or aromatic ring; and Y is an alkylene group having from 3 to 12 carbon atoms or an alkylene group having from 3 to 12 carbon atoms interrupted by a heteroatom; and

B. a Grignard catalyst for lactam polymerization; with the proviso that the equivalent ratio of



to the magnesium of the Grignard catalyst is within the range of from 0.3 to 1 to 4 to 1, and at least 10 percent of the initiator groups of the initiator system are of the (a) type.

4,501,822

HYDROESTERIFICATION OF 1-ALKENE

Paul Foley, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 342,636, Jan. 26, 1982, Pat. No. 4,422,977.
This application Aug. 31, 1983, Ser. No. 528,260
Int. Cl.³ B01J *23/44*
U.S. Cl. 502—162 **2 Claims**

1. A catalyst composition consisting of a solvent solution of solute components comprising a halide-free complex of palladium compound and tertiary hydrocarbyl phosphine or phos-

phite ligand which is in contact with a stabilizing quantity of secondary or tertiary hydrocarbyl thiol compound, and wherein the pH of the solvent solution is in the acidic range between about 1–6.

4,501,823

CATALYST FOR REFORMING OF METHANOL AND PROCESS OF PREPARING SAME

Koji Masuda, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 30, 1983, Ser. No. 567,181

Claims priority, application Japan, Apr. 28, 1983, 58-73905

Int. Cl.³ B01J *21/04, 21/06, 23/10, 23/42, 23/44*

U.S. Cl. 502—304 **17 Claims**

1. A catalyst for the reforming of methanol to hydrogen and carbon monoxide, consisting essentially of:

a carrier which comprises active alumina as a principal material thereof and is coated with a mixture consisting esssentially of cerium oxide and zirconium oxide; and

at least one catalytic metal selected from the group consisting of platinum and palladium, which is deposited on said carrier.

4,501,824

CATALYST FOR MAKING CHLORINE DIOXIDE

Kenneth L. Hardee, Middlefield; Arnold Z. Gordon, Lyndhurst; Charles B. Pyle, Chardon, and Rajat K. Sen, Cleveland Hts., all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Division of Ser. No. 344,304, Feb. 1, 1982, Pat. No. 4,381,290, which is a continuation-in-part of Ser. No. 256,969, Apr. 23, 1981, Pat. No. 4,362,707. This application Jan. 10, 1983, Ser. No. 457,013

Int. Cl.³ B01J *21/06, 23/64*

U.S. Cl. 502—339 **4 Claims**

1. A heterogeneous catalyst for producing chlorine dioxide from an aqueous solution of an acid and a chlorate comprising: a coformed crystal lattice of a plurality of platinum group metal oxides superimposed within a crystal matrix of tantalum oxide, said plurality of platinum group metals being selected from combinations consisting of ruthenium-rhodium, ruthenium-palladium, iridium-rhodium, iridium-platinum, palladium-rhodium and ruthenium-rhodium-palladium wherein each platinum group metal constituent is present in a mole ratio of not less than 0.01.

4,501,825

TIRE SEALER AND INFLATOR

Arpad M. Magyar, Conroe, and Gerald G. Smith, Kingwood, both of Tex., assignors to Pennzoil Company, Houston, Tex.

Filed Jun. 28, 1984, Ser. No. 625,531

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—78 **20 Claims**

1. A tire sealant and inflator composition comprising:

(a) 20–40 wt.% of a resin

(b) 20–40 wt.% of a latex sealant

(c) 2–20 wt.% of an alkylene glycol

(d) 0.1–15 wt.% of fibers

(e) 0.1–15 wt.% alkanolamine

(f) 0.1–10 wt.% of a foaming agent

(g) balance, water,

said composition being contained in admixture with a propellant/inflator.

4,501,826

ANION EXCHANGE RESIN HAVING A MACRORETICULAR STRUCTURE

Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 749,526, Jul. 18, 1958, Pat. No. 4,224,415. This application May 23, 1980, Ser. No. 152,940

Int. Cl.³ C08F *8/32*

U.S. Cl. 521—29 **7 Claims**

1. An anion-exchange resin comprising essentially the resinous reaction product of (a) a polymerized mass comprising essentially a cross-linked copolymer of (1) a polyvinylidene monomer containing a plurality of ethylenically unsaturated groups in nonconjugated relationship and (2) at least one monoethylenically unsaturated aliphatic ester of acrylic acid, said aliphatic ester group containing from 1 to 10 carbon atoms, said copolymer having micropores common to cross-linked copolymers, said polymerized mass being characterized by a reticular structure of microscopic channels throughout said polymerized mass, the apparent density of said polymerized mass being at least 0.02 density units less than the apparent density of a polymerized mass of the same composition without said reticular structure; and (b) an amino compound containing at least two amino groups, at least one of which is a primary amine group.

4,501,827

GLASS-REINFORCED POLYMER COMPOSITION COMPRISING 4-METHYL-1-PENTENE POLYMER IN COMBINATION WITH A GRAFT MODIFIED ACID POLYMER OF 4-METHYL-1-PENTENE POLYMER

Riichiro Nagano, Hiroshima; Hiroshi Kiga, Iwakuni, and Tadao Iwata, Chiba, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,195

Claims priority, application Japan, Dec. 27, 1982, 57-226948

Int. Cl.³ C08K *3/40*

U.S. Cl. 523—214 **18 Claims**

1. A glass-reinforced polymer composition comprising:

80 to 99.99 parts by weight of a 4-methyl-1-pentene polymer;

0.01 to 20 parts by weight of a graft-modified polymer of 4-methyl-1-pentene having grafted units of an unsaturated carboxylic acid or an acid anhydride thereof in amount of from 0.5% by weight to 15% by weight and a limiting viscosity[n] at 135° C. in decalin falling within a range between 0.3 dl/g and 10 dl/g, inclusive; and

1 to 300 parts by weight of glass fibers with respect to 100 parts by weight of a sum of the 4-methyl-1-pentene polymer and the graft-modified polymer.

4,501,828

DISSOLVING WATER SOLUBLE POLYMERS

Albert F. Hadermann, Ijansville, Md.; Jerry C. Trippe, Fairfax Station, Va., and Paul F. Waters, Washington, D.C., assignors to General Technology Applications,Inc., Reston, Va.

Filed Jan. 20, 1983, Ser. No. 459,506

Int. Cl.³ C08L *33/26, 71/02*

U.S. Cl. 523—309 **15 Claims**

1. A method for dissolving relatively high molecular weight water-soluble polymers in liquids which are solvents for those polymers comprising:

freezing said solvent and forming it into relatively finely divided, free flowing solid particles;

chilling particulate solid polymer to a temperature below the freezing point of said solvent;

mixing said frozen solvent particles with said chilled particulate polymer, and

allowing said mixture to warm to a temperature above the freezing point of said solvent whereby polymer particles dissolve in melting solvent particles to form a solution.

4,501,829
COATING COMPOSITION

Shoji Oda, Hiroshima; Kunihiko Ehara, Osaka; Hirotoshi Umemoto, Kyoto, and Shinji Nakano, Hyogo, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 6, 1983, Ser. No. 529,873
Claims priority, application Japan, Sep. 6, 1982, 57-155633
Int. Cl.³ C08K 5/34, 3/22
U.S. Cl. 523—400 13 Claims

1. A coating composition comprising

(A) a polyester resin modified with a lactone having 6 to 8 ring carbon atoms (I) or a mixture of said lactone-modified polyester resin (I) and a non-modified polyester resin (II), the lactone content being from 5 to 40% by weight of the total polyester resin solid content of (I) or (I+II), said polyester resin having an average number molecular weight of 800~4000, a hydroxyl value of 50~200 mg KOH/g and a resinous acid value of 2~20 mg KOH/g,

(B) a crosslinking agent,

(C) a pigment and

(D) 0~20% by weight of the total amounts of polyester resin and crosslinking agent of epoxy resins(s),

said pigment amounting to 40~60% by weight of the total solid matter, and wherein the film formed has a static Tg of −10°~30° C., an elongation of 7~80% and a tensile strength of 150~350 Kg/cm².

4,501,830
RAPID SET LIGHTWEIGHT CEMENT PRODUCT

Richard Miller, Crofton, and Janine M. Rizer, Mechanicsville, both of Md., assignors to Research One Limited Partnership, Towson, Md.

Filed Jan. 5, 1984, Ser. No. 568,358
Int. Cl.³ C04B 7/02, 7/32/7/35; C08G 51/24
U.S. Cl. 523—401 8 Claims

1. A rapid set lightweight cement product which hardens in less than one hour and which then exhibits a density of less than 90 pounds per cubic foot and which has been poured from a mixture comprising in % by weight:

Class H Portland Cement	35 to 45
mixture of Condensed Silica Fume, Flyash, Cenospheres and finely divided Crystalline Silica Particles;	38 to 50
Epoxy emulsion, Curing Agent, Accelerator and Water	10 to 15 5.5 to 15.

4,501,831
AQUEOUS COATING COMPOSITIONS AND PROCESS FOR THEIR PREPARATION FROM EPOXY ACIDIC ACRYLIC POLYMER AND POLYFUNCTIONAL AMINE

Shaw C. Chu, 68 Riverview Ter., Belle Mead, N.J. 08502, and Arthur T. Spencer, 105 Madison Ave., New Providence, N.J. 07974

Filed Dec. 27, 1983, Ser. No. 566,081
Int. Cl.³ C08L 63/00; C09D 3/58, 5/02
U.S. Cl. 523—412 17 Claims

1. A non-gelled composition which is self-emulsifiable in water containing copolymer having carboxyl groups and substantially free of oxirane groups, which composition is the reaction product of

A. an acidic copolymer having an acid number greater than 150 comprising a solution copolymer of monoethylenically unsaturated monomers containing at least about 20% by weight monoethylenically unsaturated carboxylic acid monomer based on the total weight of the monomers; and

B. an epoxy resin comprising aromatic polyether containing oxirane groups; said epoxy resin comprising at least 20% of the total resin solids and containing sufficient oxirane groups to provide a ratio of oxirane groups to carboxyl groups from 1:2 to 1:20; in which the reaction is conducted in the presence of a poly-tertiary-amine.

4,501,832
WATER-REDUCIBLE EPOXY COATING COMPOSITIONS

Richard A. Albers, Irvine, Calif., assignor to Deft Chemical Coatings, Inc., Irvine, Calif.

Division of Ser. No. 143,916, Apr. 25, 1980, Pat. No. 4,352,898.
This application May 7, 1982, Ser. No. 375,997
Int. Cl.³ C08J 3/08; C08L 63/00; C07D 3/58
U.S. Cl. 523—414 32 Claims

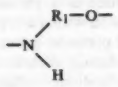
1. A kit for forming a coating comprising (a) a first container modified polyamine resin, the modified polyamine resin being inherently insoluble and non-dispersible in water, and (b) a second container containing (i) epoxy resin curable by the modified polyamine resin and (ii) sufficient nitroparaffin so that when the contents of the two containers are combined in about stoichiometric proportions to form a coating, water in an amount of at least 50% by weight of the modified polyamine resin can be added to the coating composition, both containers containing substantially no emulsifier, the nitroparaffin having the formula C_nX_{2n+2} where n is an integer from 1 to 4 and each X is independently selected from the group consisting of chlorine, hydrogen, and NO_2, where at least one but no more than two X's are NO_2.

4,501,833
LOW TEMPERATURE AMINOPLAST CURABLE CATIONIC ELECTRODEPOSITABLE COATING COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 16, 1983, Ser. No. 495,306
Int. Cl.³ C08L 63/00
U.S. Cl. 523—416 16 Claims

1. An improved, curable cationic coating composition comprising an onium group-containing polymer and an aminoplast curing agent, characterized in that the aminoplast curing agent has at least one group of the structure:



wherein R_1 is carbon derived from an aldehyde or ketone and the aminoplast is present in amounts sufficient to cure the composition.

4,501,834
GELS FORMED FROM ANIONIC AND CATIONIC POLYMERS

Dean T. Su, North Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,589
Int. Cl.³ A61K 7/00, 7/06; B32B 21/04
U.S. Cl. 524—28 11 Claims

1. A clear gel in water which comprises water containing the reaction product formed by the rapid and intensive agitation of a cationic polymer bearing a positive charfe selected from the group consisting of poly (diallyldimethylammonium chloride), poly(diallyldimethylammonium chloride-co-acrylamide), and a quaternary ammonium cellulose ether polymer and an anionic polymer bearing a negative charge selected from the group consisting of polysulfonic acid and alginic acid, said gel having a viscosity sufficient to yield a viscosity upon dilution with water which exceeds the viscosity of a corresponding aqueous concentration of the individual polymers.

4,501,835
POLYACRYLIC ACID/CHITOSAN POLYELECTROLYTE COMPLEX

Carl M. Berke, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 355,679, Mar. 8, 1982, abandoned. This application Nov. 9, 1983, Ser. No. 549,833
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.³ C08L *5/08*; B01D *13/00*
U.S. Cl. 524—32 **34 Claims**

1. As a novel composition of matter, a polyacrylic acid/chitosan complex, wherein the molecular weight (weight average) of said polyacrylic acid is less than about 10,000.

21. A method for preparing a membrane which comprises forming a polyelectrolyte complex by dissolving chitosan in an acid, adding a solution of polyacrylic acid having a molecular weight (weight average) of less than 10,000 thereto and coating a support with said complex.

4,501,836
LIQUID REFRACTORY BINDER

Masayuki Nakamura; Masaaki Tsuriya, and Masahiko Funabashi, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,324
Claims priority, application Japan, May 18, 1982, 57-82448
Int. Cl.³ C08L *95/00*
U.S. Cl. 524—66 **18 Claims**

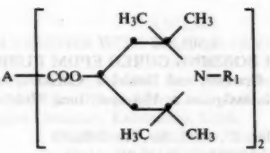
1. A liquid binder for refractory aggregates comprising tar, pitch or mixture thereof, and a liquid resin component comprising a solvent having a boiling point of at least 75° C. and a resole phenolic resin prepared using a catalyst system of ammonia, amines or mixtures thereof, wherein the range of solvent to 100 parts by weight of effective resole phenolic resin is less than 100 parts by weight, and the solvent is selected from the group consisting of glycols, ketones, esters and ethers.

4,501,837
PIPERIDINE DERIVATIVES WHICH ARE STABILISERS FOR SYNTHETIC POLYMERS

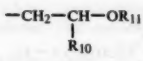
Giuseppe Cantatore, Bologna, Italy, assignor to Ciba-Geigy S.p.A., Origgio, Italy

Division of Ser. No. 215,925, Dec. 12, 1980, Pat. No. 4,369,321. This application Aug. 31, 1982, Ser. No. 413,439
Claims priority, application Italy, Dec. 21, 1979, 28324 A/79
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—100 **4 Claims**

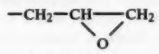
1. A compound of the formula



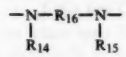
or an acid addition salt thereof, in which
R_1 represents
(a) hydrogen,
(b) C_1–C_{12}—alkyl,
(c) $—CH_2CN$
(d) C_3–C_{12}—alkenyl,
(e) C_3–C_{12}—alkinyl,
(f) benzyl,
(g) benzyl substituted by 1 to 3 C_1–C_4—alkyl radicals,
(h) hydroxybenzyl,
(i) hydroxybenzyl substituted by 1 to 3 C_1–C_4—alkyl radicals
(j) a $—COR_8$, $—COOR_8$, $—Ch_2COOR_8$ or $—CONR_8R_9$ radical in which R_8 and R_9, which may be identical or different, represent
(1) linear or branched C_1–C_{12}—alkyl,
(2) C_3–C_{12}—alkenyl,
(3) C_5–C_{12}—cycloalkyl,
(4) phenyl,
(5) phenyl substituted by 1 to 3 C_1–C_8—alkyl radicals,
(6) hydroxyphenyl,
(7) hydroxyphenyl substituted by 1 to 3 C_1–C_8—alkyl radicals,
(8) C_7–C_{12}—aralkyl, or
(9) 2,2,6,6-tetramethyl-piperidin-4-yl,
(k) a



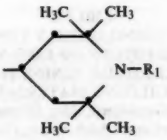
radical, in which R_{10} is hydrogen, methyl or phenyl and R_{11} is hydrogen, $—R_8$, $—COR_8$ or $—CONR_8R_9$, in which R_8 and R_9 are as defined above, or
(l) a



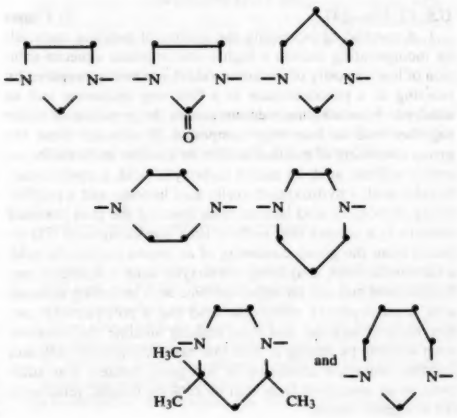
radical;
and A is a radical of the formula



in which R_{14} and R_{15}, which may be identical or different, are C_5–C_{12} cycloalkyl or a radical of the formula



in which R_1 is as defined above, and R_{16} is C_1–C_{20}alkylene, C_6–C_{12}arylene or C_7–C_{12}aralkylene; or A is a bivalent radical selected from the group consisting of



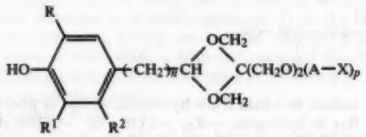
4,501,838

STABILIZED OLEFIN POLYMERS

Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 262,267, May 11, 1981, abandoned.
This application Sep. 14, 1982, Ser. No. 418,104
Int. Cl.³ C08K 5/11
U.S. Cl. 524—108 5 Claims

1. An olefin polymer composition comprising an olefin polymer and a effective stabilizing amount of an ester of a pentaerythritol monoacetal having the structure



where R is alkyl, cycloalkyl or aralkyl having 3–10 carbon atoms, r^1 is alkyl or 1–6 carbon atoms, R_2 is lower alkyl or hydrogen, A is

X is alkyl phenyl or (hydroxy phenyl)alkyl where the alkyl in each case has 1–6 carbon atoms, n is 0–3 and p is 2.

4,501,839

METHOD OF USING HIGHLY CONCENTRATED AQUEOUS SOLUTIONS OF LOW VISCOSITY OF MELAMINE/ALDEHYDE RESINS FOR IMPROVING BUILDING MATERIALS

Theodor A. Bürge, Geroldswil; Jürg Widmer, Zurich; Theodor Meyer, Regensdorf, and Ulrich Sulser, Oberengstringen, all of Switzerland, assignors to Sika AG, vorm. Kaspar Winkler & Co., Zurich, Switzerland

Filed Dec. 14, 1983, Ser. No. 561,328
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107852
Int. Cl.³ C08L 61/28
U.S. Cl. 524—247 21 Claims

1. A method of increasing the quality of building materials by incorporating therein a highly concentrated aqueous solution of low viscosity of melamine/aldehyde resins, prepared by reacting to a precondensate in a first step melamine and an aldehyde in an alkaline medium and in the presence of water together with at least one compound (I) selected from the group consisting of an alkali sulfite, an alkaline earth sulfite, an amino sulfonic acid, an amino carboxylic acid, a hydroxycarboxylic acid, a hydroxycarboxylic acid lactone, and a polyhydroxy carboxylic acid lactone then reacting the thus obtained mixture in a second step with at least one compound (II) selected from the group consisting of an amino carboxylic acid, a carboxylic acid, a hydroxy carboxylic acid, a hydroxy carboxylic acid lactone, an amino sulfonic acid including sulfamic acid, a polyhydroxy carboxylic acid and a polyhydroxy carboxylic acid lactone, and then making alkaline the obtained resin solution by adding at least one basic compound (III), said building materials consisting of inorganic binders and additives, in an amount of from 0.01 to 25% by weight, relative to the inorganic binder.

4,501,840

ALKALINE MODIFIED PENTAERYTHRITOL STABILIZER FOR VINYL CHLORIDE RESIN

Peter Werle, Gelnhausen, and Wolfgang Merk, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,965
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239086
Int. Cl.³ C08L 27/06
U.S. Cl. 524—387 25 Claims

1. A process for producing a costabilizer suitable for the stabilization of polyvinyl chloride comprising heating pentaerythritol at a temperature of about 180° to 220° C. with a strongly alkaline acting material.

4,501,841

ELASTOMERIC INSULATING MATERIALS FOR ROCKET MOTORS

Liles G. Herring, Waco, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 3, 1983, Ser. No. 463,365
Int. Cl.³ C08L 21/00; F42B 9/16; F02K 9/34
U.S. Cl. 524—411 5 Claims

1. An elastomeric insulating material for use in rocket motors as low smoke case wall or blast tube ramp insulation, said elastomeric insulating material having a density between about 0.035 and 0.045 and consisting essentially of:

100 parts by weight of peroxy crosslinked EPDM in which are dispersed between about 10 and 100 parts by weight of a char forming organic fiber comprising polyaramide pulp and between about 5 and 75 parts by weight of inorganic particulate.

4,501,842

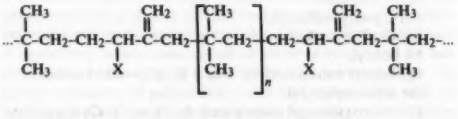
ADHESIVE FOR BONDING CURED EPDM RUBBER

Chester T. Chmiel, Granger, and Daniel J. Cotsakis, Mishawaka, both of Ind., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Dec. 27, 1983, Ser. No. 565,266
Int. Cl.³ C08L 9/00, 15/02, 53/00
U.S. Cl. 524—432 10 Claims

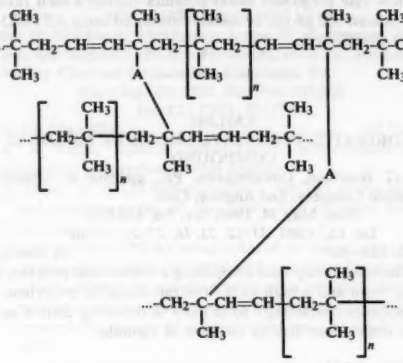
1. An adhesive for bonding cured EPDM comprising:

(A) a halogenated butyl rubber of the formula:



where X is Cl or Br and n is about 50

(B) a pre-cross linked butyl rubber of the formula:



where A is a crosslinking agent and n is about 50

(C) a styrene/ethylene butylene/styrene block thermoplastic rubber,

(D) a thermoplastic, petroleum hydrocarbon feedstock derived aliphatic monomer resin derived from C_5–C_9 streams polymerized to varying molecular weights to give a softening point range of 162°–181° C. and

(E) an aliphatic isocyanate; wherein (A) is at a concentration of 20.0–45.0 PPHR, (B) is at a concentration of 40.0–65.0 PPHR, (C) is at a concentration of 15.0–20.0 PPHR, (D) is at a concentration of 120–160 PPHR and (E) is at a concentration of 20–35 PPHR.

4,501,843

COMPOSITION OF POLYMER OF OLEFIN WITH MIXED MINERAL FILLER

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1984, Ser. No. 592,495
Int. Cl.³ C08K *3/34*
U.S. Cl. 524—445 **16 Claims**

1. A composition comprising polymer of olefin, mica, and talc having improved flexural modulus as compared to said polymer of olefin alone, said polymer of olefin present in an amount of about 60 to about 80 weight percent of the total composition, said mica present in an amount of about 10 to about 20 weight percent of the total composition and said talc present in an amount of about 10 to about 20 weight percent of the total composition.

4,501,844

POLYAMIDES WITH TALC AS CRYSTALLIZATION PROMOTER

Augustin T. Chen; David J. Goldwasser, both of Cheshire, and Kemal Onder, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 5, 1983, Ser. No. 558,148
Int. Cl.³ C08K *3/34*
U.S. Cl. 524—451 **10 Claims**

1. A composition comprising a blend of,

a linear polyamide selected from the group consisting of poly(4,4'-methylenediphenylene azelamide), poly(4,4'-methylenediphenylene sebacamide), poly(4,4'-methylenediphenylene undecanediamide), poly(4,4'-methylenediphenylene dodecanediamide), and mixtures thereof, said polyamide characterized in that it has been prepared by the reaction of 4,4'methylenebis (phenyl isocyanate) and the corresponding dicarboxylic acid or by the reaction of 4,4'-methylenebis(aniline) and the corresponding dicarboxylic acid dihalide, said polyamide being further characterized by an inherent viscosity of from about 0.5 to about 1.5 determined as a 0.5 percent by weight solution in N-methylpyrrolidone containing about 4 percent by weight lithium chloride at 30° C; and

talc,

said talc being present in an amount at least sufficient to promote the crystallization of said linear polyamide (A).

4,501,845

EMULSION POLYMER OF HETEROGENEOUS MOLECULAR WEIGHT AND PREPARATION THEREOF

Richard E. Baus, Warminster, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 313,400, Oct. 21, 1981, abandoned, which is a continuation of Ser. No. 119,728, Feb. 8, 1980, abandoned. This application May 31, 1983, Ser. No. 499,127
Int. Cl.³ C08F *2/16*
U.S. Cl. 524—460 **10 Claims**

1. In a process of preparing an emulsion polymerized latex addition polymer in which the molecular weight of the polymer is widely divergent and the Tg of the polymer is between 10° C. and −60° C., the improvement in which a monomer mixture which is at least predominantly of alpha, beta-monomethylenically unsaturated monomers and is polymerized by a free radical method, the polymerization being conducted in stages in which the first stage of the polymerization is conducted in the absence of a chain transfer agent, whereby a high molecular weight polymer fraction is obtained, and at least one additional stage of the polymerization is conducted in the presence of the chain transfer agent, whereby at least one low molecular weight fraction is obtained, in which from about 5 to 70% of the monomers are polymerized to give a fraction which has a $\overline{M}_n$ of between about 500 and 100,000 and from about 30% to 90% of the monomers are polymerized to give a fraction which has a $\overline{M}_n$ of about 100,000 to at least 2,000,000 and the ratio of $\overline{M}_w/\overline{M}_n$ is from 15 to 150, the molecular weight being determined by gel permeation chromatography.

4,501,846

COMPOSITION FOR TUFTED CARPETS

Raymond W. Goss, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 30, 1983, Ser. No. 509,747
Int. Cl.³ C08K *5/01*
U.S. Cl. 524—476 **16 Claims**

1. A composition having a Brookfield viscosity of from about 25 to 500 centipoise at about 150° C. comprising, by weight:

(a) from about 1% to about 19% of a low density polyethylene having a melt index of from about 70 to about 425;

(b) from about 0.1% to about 5% of a nitrogen-containing silane cross-linking compound having the general formula

$$X_3—Si—R—Z$$

where R is an organic radical, X is selected from halo, hydroxy, alkoxy, aryloxy, organo oxycarbonyl, azido, amine, and amide radicals; and Z is selected from

$$—O—\overset{\overset{O}{\|}}{C}—\overset{\overset{R'}{|}}{C}N_2,\ —OCN_3,\ \text{and}\ —SO_2N_3;$$

where R' is selected from hydrogen, alkyl, cycloalkyl, aryl and —COOR" radicals; where R" is selected from alkyl, cycloalkyl, and aryl radicals;

(c) from about 65% to about 85% of a resin having a Ring and Ball softening point of from about 50° C. to about 115° C. selected from the group consisting of hydrocarbon resins and esters of rosin;

(d) from about 5% to about 7% of a hydrocarbon wax; and

(e) up to about 30% of a naphthenic oil.

15. A process for making a composition having a Brookfield viscosity of from about 25 to about 500 centipoise at about 150° C. comprising the steps of:

(a) tumble drying

(i) from about 1% to about 19% of a low density polyethylene having a melt index of from about 70 to about 425; and

(ii) from about 0.1% to about 5% of a nitrogen-containing silane cross-linking compound having the general formula

$$X_3—Si—R—Z$$

where R is an organic radical, X is selected from halo, hydroxy, alkoxy, aryloxy, organo oxycarbonyl, azido, amine, and amide radicals; and Z is selected from

$$—O—\overset{\overset{O}{\|}}{C}(\overset{R'}{|})—CN_2,\ —OCN_3,\ \text{and}\ —SO_2N_3;$$

where R' is selected from hydrogen, alkyl, cycloalkyl, aryl and —COOR" radicals; where R" is selected from alkyl, cycloalkyl, and aryl radicals; to form a product;

(b) admixing

(i) from about 65% to about 85% of a resin having a Ring and Ball softening point of from about 50° C. to about 115° C. selected from the group consisting of hydrocarbon resins and esters of rosin; and

(ii) from about 5% to about 7% of a hydrocarbon wax to form a blend;

(c) adding the product of (a) to the blend of (b); and

(d) admixing.

16. The process of claim 15 wherein the blend of (b) further comprises up to about 30% naphthenic oil mixed therein.

4,501,847

POLYMERIC ANTITUMOR AGENT

Victor D. Papanu, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 9, 1981, Ser. No. 281,544

Int. Cl.³ C08K *3/16;* **C08F** *122/04*

U.S. Cl. 524—502 **6 Claims**

1. An antitumor-active composition of matter selected from the group consisting of low molecular weight homopolymers of itaconic anhydride having average molecular weights of from about 400 to about 5000 and derivatized to contain (a) half-amide, half-carboxyl acid groups and (b) imide groups in which said imide groups comprise from about 3% by weight to about 35% by weight of said derivatized groups, and the pharmaceutically acceptable cationic salt derivatives of said derivatized homopolymers.

4,501,848

VINYLIDENE CHLORIDE COPOLYMER-BASED MOLDING COMPOUND

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 24, 1984, Ser. No. 613,844

Int. Cl.³ C08L *27/08, 23/16, 23/12, 23/26*

U.S. Cl. 524—527 **14 Claims**

1. A molding compound comprising: (a) a vinylidene chloride copolymer resin and (b) from about 0.1 to about 10 parts per each 100 parts of vinylidene chloride copolymer resin of a high melt flow rate isotactic propylene-based polymer containing 0 to 15 mole % recurring units of an olefinic comonomer having the general formula:

$$CH_2=CRR^1$$

wherein R is a member selected from the group consisting of hydrogen and aromatic and aliphatic hydrocarbon groups containing 2 to 20 carbon atoms and R^1 is a member selected from the group consisting of hydrogen and methyl, said high melt flow rate propylene based polymer having a melt flow rate of at least 300 grams/10 minutes measured using ASTMD-1238-79 Condition L.

4,501,849

CHLORINATED POLYVINYL CHLORIDE MOLDING COMPOUND

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 24, 1984, Ser. No. 613,848

Int. Cl.³ C08L *23/12, 23/16, 27/24, 23/26*

U.S. Cl. 524—527 **16 Claims**

1. A molding compound comprising a chlorinated polyvinyl chloride resin and a high melt flow rate isotactic propylene-based polymer containing 0 to 15 mole % recurring units of an olefinic comonomer having the general formula:

$$CH_2=CRR^1$$

wherein R is a member selected from the group consisting of hydrogen and aromatic and aliphatic hydrocarbon groups containing 2 to 20 carbon atoms and R^1 is a member selected from the group consisting of hydrogen and methyl, said high melt flow rate propylene based polymer having a melt flow rate of at least 300 grams/10 minutes measured using ASTMD-1238-79 Condition 2.

4,501,850

POLYVINYL CHLORIDE MOLDING COMPOUND

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 24, 1984, Ser. No. 613,855

Int. Cl.³ C08L *23/12, 23/16, 23/26, 27/06*

U.S. Cl. 524—527 **15 Claims**

1. A molding compound comprising a polyvinyl chloride resin and from about 0.1 to about 10 parts per each 100 parts of polyvinyl chloride resin of a high melt flow rate isotactic propylene-based polymer containing 0 to 15 mole % recurring units of an olefinic comonomer having the general formula:

$$CH_2=CRR^1$$

wherein R is a member selected from the group consisting of hydrogen and aromatic and aliphatic hydrocarbon groups containing 2 to 20 carbon atoms and R^1 is a member selected from the group consisting of hydrogen and methyl, said high melt flow rate propylene based polymer having a melt flow rate of at least 300 grams/10 minutes measured using ASTMD-1238-79 Condition L.

4,501,851

UREA-FORMALDEHYDE PRECURSOR

James H. Williams, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 416,573, Sep. 10, 1982, Pat. No. 4,410,685. This application Feb. 28, 1984, Ser. No. 584,441

Int. Cl.³ C08L *51/00;* **C08G** *12/12*

U.S. Cl. 524—542 **29 Claims**

27. An aqueous dispersion of a urea-formaldehyde resin precursor having a molar ratio of formaldehyde to urea in the range from about 3.25:1 to about 2.5:1, said dispersion being characterized by having a solids content in the range 62% to 69%, a pH of 7.2 to 8.0, and a viscosity not in excess of about 200 cps as measured on a Brookfield Viscometer Model RVF, No. 1 spindle, at 20 rpm and at 25° C., after storage, following its production, for 102 days at a temperature of 72° F.

4,501,852
STABLE, AQUEOUS DISPERSIONS OF POLYURETHANE-UREAS

Peter H. Markusch, McMurray; James W. Rosthauser, Imperial, and Michael C. Beatty, Pittsburgh, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 20, 1983, Ser. No. 505,600
Int. Cl.³ C08L 75/12
U.S. Cl. 524—591 **17 Claims**

1. A stable, aqueous dispersion of polyurethane-ureas wherein said polyurethane-ureas contain

(i) about 10 to 120 milliequivalents per 100 grams of said polyurethane-ureas of chemically incorporated anionic groups, and

(ii) up to about 10% by weight, based on the weight of said polyurethane-ureas, of lateral and/or terminal hydrophilic chains, containing ethylene oxide units, wherein the counterions of said anionic groups are a mixture of volatile and nonvolatile cations in an equivalent ratio of about 1:4 to 4:1.

4,501,853
EPOXY RESIN COMPOSITION AND METHOD FOR THE PREPARATION OF THE SAME

Masaru Sugimori; Koichiro Sanji, both of Takatsuki; Hirohide Tomoyasu, Moriyama, and Toshimori Sakakibara, Shiga, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1982, Ser. No. 428,160
Claims priority, application Japan, Nov. 26, 1981, 56-190103
Int. Cl.³ C08L 9/00, 63/00, 75/04, 81/04
U.S. Cl. 525—122 **8 Claims**

1. A curable epoxy resin composition which comprises 100 parts by weight of an epoxy resin which is liquid at room temperature or at an elevated temperature and 0.05 to 60 parts by weight of vulcanized rubber particles having a particle size of 0.5 to 30μ, said composition made by vulcanizing with a vulcanizing agent at an elevated temperature a dispersion in the epoxy resin of fine particles of a liquid rubber immiscible at that elevated temperature with the epoxy resin, wherein said epoxy resin remains uncured at the time of the vulcanization of said rubber particles.

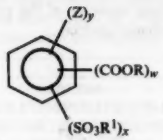
6. A method for the preparation of a curable epoxy resin composition, which comprises the steps of heating an epoxy resin, to form a liquid epoxy resin adding thereto a liquid rubber incompatible with the epoxy resin in an amount of 0.05 to 60 parts by weight per 100 parts by weight of the epoxy resin, stirring the mixture and thereby dispersing the liquid rubber in the liquid epoxy resin, and vulcanizing the rubber with a vulcanizing agent to form a dispersion of solid fine particles of vulcanized rubber having a particle size of 0.5 to 30μ in said liquid epoxy resin.

4,501,854
AMINOPLAST CURABLE COMPOSITIONS CONTAINING DISULFONIC ACID ESTERS AS LATENT ACID CATALYSTS

Debra L. Singer, Pittsburgh; Gregory J. McCollum, Glenshaw, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1983, Ser. No. 551,388
Int. Cl.³ C08L 61/28
U.S. Cl. 525—162 **9 Claims**

1. In a curable composition capable of acid catalyzed cross-linking, comprising an active hydrogen-containing resin, a curing agent present externally and/or internally as a part of the active hydrogen-containing resin, and an acid catayst, wherein the improvement comprises using as the acid catalyst a catalytic amount of a sulfonate represented by the following structural formula:



wherein:

Z is a radical independently selected from C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{18} aryl, halogen, alkoxy, hydroxyl, and aryloxy;

R is independently selected from hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, and C_6 to C_{18} aryl;

R^1 is independently selected from C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, hydroxyalkyl, and hydroxycycloalkyl;

y is an integer from 0 to 4,

w is an integer from 0 to 2, and

x is an integer from 1 to 3, with the proviso that when w is 0, y is an integer from 1 to 4 and x is an integer from 2 to 3 and when y is 0, w is an integer from 1 to 2 and x is an integer from 1 to 3.

4,501,855
COMB CATIONIC POLYMERS AND AQUEOUS DISPERSIONS THEREOF

Gerry K. Noren, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 29, 1981, Ser. No. 316,960
Int. Cl.³ C08L 33/26
U.S. Cl. 525—218 **14 Claims**

1. A comb cationic polymer constituted by an amine polymer rendered cationic and water dispersible with the aid of a solubilizing acid, said amine polymer being the product of reaction of: (1) a soluble reactive polymer having an average molecular weight in the range of about 500 to about 10,000 and having a plurality of functional groups reactive with carboxyl or amino hydrogen functionality; with (2) a solution addition copolymer of monoethylenically unsaturated monomers containing copolymerized tertiary amine monomer, said copolymer being terminated with a single carboxy group or a single amino hydrogen atom, and said copolymer being free of reactive groups capable of reacting with the functional groups of said soluble polymer, except for said single carboxyl group or single amino hydrogen atom, and said copolymer being used in an amount of at least 10% of the weight of said soluble polymer and being substantially completely reacted therewith.

4,501,856
COMPOSITE CONTAINING POLYOLEFIN FIBER AND POLYOLEFIN POLYMER MATRIX

Gary A. Harpell, Morristown; Sheldon Kavesh, Whippany; Igor Palley, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 19, 1982, Ser. No. 359,974
Int. Cl.³ C08L 23/06, 23/12
U.S. Cl. 525—240 **15 Claims**

1. A composite structure comprising:

(a) a network of polyolefin fibers selected from the group consisting of polyethylene and polypropylene fibers having a weight average molecular weight of at least about 500,000, a tenacity of at least about 15 g/denier and a main melting point of at least about 140° C. for polyethylene fiber, and a tenacity of at least about 11 g/denier and a main melting point of at least about 168° C. for polypropylene fiber; and

(b) a matrix comprising a polymer having polyethylene or polypropylene crystallinity with a melting or sticking point at least 3° C. lower than the melting point of the polyolefin fiber;

said composite structure having a tenacity at least 75% of the volume average tenacity of the polyolefin fiber network and the polymer matrix.

4,501,857

METHOD FOR HYDROGENATION OF POLYMER

Yasushi Kishimoto, Ayase, and Hideo Morita, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 6, 1984, Ser. No. 568,692

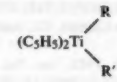
Claims priority, application Japan, Jan. 20, 1983, 58-6718; Oct. 7, 1983, 58-186983

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—338 31 Claims

1. A method for the hydrogenation of a conjugated diene polymer in an inert organic solvent, said polymer being obtained by polymerization or copolymerization of a conjugated diene, which comprises effecting selective hydrogenation of unsaturated double bonds in the conjugated diene units of said conjugated diene polymer in the presense of:

(A) at least one bis-(cyclopentadienyl)titanium compound represented by the formula:



wherein R and R′ denote the same or different moieties selected from the group consisting of C_1–C_8alkyl and alkoxy groups, C_6–C_8aryl, aryloxy, aralkyl and cycloalkyl groups, halogen groups, and carbonyl groups, and

(B) at least one hydrocarbon lithium compound having at least one lithium atom ion

as catalysts, with the molar ratio of lithium atoms to titanium atoms being from 0.1 to 100.

4,501,858

ACCELERATORS FOR VULCANIZING VINYLIDENE FLUORIDE ELASTOMERIC COPOLYMERS

Giovanni Moggi, Milan, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Mar. 21, 1984, Ser. No. 591,994

Claims priority, application Italy, Mar. 22, 1983, 20196 A/83

Int. Cl.³ C08J *3/24*

U.S. Cl. 525—340 4 Claims

1. A vulcanizable fluoroelastomeric composition, comprising:

(A) a copolymer of elastomeric nature based on vinylidene fluoride and of at least another fluorinated monomer,

(B) a substance having the property of neutralizing acids, selected from amongst the oxides of divalent metals, the hydroxides of divalent metals and mixtures of such oxides and hydroxides with metal salts of weak acids,

(C) a polyhydroxyl aromatic compound suited to act as a vulcanizing agent for the copolymer,

and characterized in that it contains, as a vulcanization accelerator, a compound having the structure of bis(triarylphosphin)-iminium salt of general formula:

$$[Ar_3P{=}N{=}N\ Ar_3]_n{}^+ . X^{n-}$$

wherein Ar is an aryl radical, n=1 or 2, X is a monovalent or divalent anion.

4,501,859

PROCESS FOR THE MANUFACTURE OF HALOGENATED POLYMERS

Neil F. Newman, Edison, and Ronald C. Kowalski, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 481,369, Apr. 1, 1983, Pat. No. 4,486,575, which is a continuation-in-part of Ser. No. 306,882, Sep. 30, 1981, Pat. No. 4,384,072. This application Apr. 1, 1983, Ser. No. 481,279

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ C08F *8/22*

U.S. Cl. 525—356 48 Claims

1. A process for the continuous production of halogenated polymer by reacting said polymer and a halogenating agent in an extruder-reactor, said extruder-reactor comprising feed zone (A), reaction zone (B) and neutralization zone (C) in sequence; screw means traversing zones (A) through (C); first flow restriction means following said feed zone; injection means for supplying said halogenating agent to said reaction zone; mixing means for subjecting said polymer in said reaction zone to a high degree of mixing; second flow restriction means disposed between said reaction zone and said neutralization zone; and injection means for supplying neutralizing agent to the product mixture produced in said reaction zone; further comprising subjecting polymer in said feed zone to conditions of temperature and pressure sufficient to generate a cohesive mass; conveying said mass past said first restriction means to said reaction zone; halogenating said polymer in said reaction zone by injecting said halogenating agent at a position filled with said polymer and subjecting the reactants to a high degree of mixing; conveying said product mixture past said second restriction means; injecting said neutralizing agent and neutralizing said product mixture with said neutralizing agent in said neutralizing zone; and delivering said halogenated polymer product from the extruder-reactor.

4,501,860

REAGENTS FOR GRAFT COPOLYMERS

David S. Campbell; Andrew J. Tinker, and Peter G. Mente, all of Hertfordshire, England, assignors to The Malaysian Rubber Producers' Research Association, England

Filed May 4, 1982, Ser. No. 374,866

Claims priority, application United Kingdom, May 7, 1981, 8113986

Int. Cl.³ C08K *5/23;* C08L *25/04, 33/08, 83/04*

U.S. Cl. 525—359.4 8 Claims

1. A method of preparing an azodicarboxylate-functional polymer by mixing a hydroxyl-functional polymer with a compound having the formula:

$$ZCO.N(H)_x.N(H)_x.CO.OR$$

where ZCO—is a carboxylic acid derivative reactive towards hydroxyl groups, wherein 2 is halogen or aryloxy

x is 0 or 1, and

R is a C_1 to C_{12} primary or secondary straight- or branched-chain alkyl, cycloalkyl, aralkyl, aryl or alkaryl group;

in an anhydrous organic reaction medium which is a solvent for the reactants; maintaining the mixture under conditions to effect reaction between the polymer and the compound; when x is 1, oxidizing the hydrazo group of the product to an azo group; and recovering the resulting azodicarboxylate-functional polymer.

4,501,861

THERMOPLASTIC POLYAMIDE COMPOSITIONS

James C. Woodbrey, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

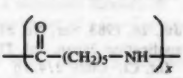
Continuation-in-part of Ser. No. 437,990, Nov. 1, 1982, abandoned. This application Jan. 31, 1983, Ser. No. 462,248
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.[3] C08L 77/00
U.S. Cl. 525—421 35 Claims

1. A composition comprising:

(a) poly(ε-caprolactam) resin of viscosity average molecular weight of at least about 15,000; and

(b) at least one block polymer having

(i) from about 25 to about 80 weight percent poly(ε-caprolactam) segments of the formula:



wherein x is an integer equal to 5 or more; and

(ii) from about 75 to about 20 weight percent of segments having a number average molecular weight of at least 300 selected from the group consisting of segments of poly(propylene oxide), polycaprolactone, polytetrahydrofuran, polybutadiene, polyisoprene, polyisobutylene, poly(C1–C8 alkylene acrylate), poly(C1–C4 dialkylene siloxane), poly(ethylene-co-propylene), poly(ethylene-co-carbon monoxide), and combinations thereof; said (ii) segments being connected to an (i) polyamide segment through groups selected from amide, ester, urea, carbamate, and imides;

provided that the composition contains from about 15 to about 85 weight percent of Component (a) and from about 85 to about 15 weight percent of Component (b).

4,501,862

WET STRENGTH RESIN FROM AMINOPOLYAMIDE-POLYUREYLENE

Gerald I. Keim, West Grove, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 497,362, May 23, 1983, abandoned. This application Aug. 26, 1983, Ser. No. 526,304
Int. Cl.[3] C08G 69/48
U.S. Cl. 525—430 13 Claims

1. A process for preparing an aqueous solution of a water-soluble, cationic thermosetting resin which process comprises reacting methylbisaminopropylamine with (a) oxalic acid or a lower alkyl diester of oxalic acid and (b) urea to form an aminopolyamide-polyureylene intermediate containing tertiary amine groups, the mole ratio of (a) to (b) being from about 0.1:1 to about 10:1 and the mole ratio of methylbisaminopropylamine to (a) plus (b) being from about 0.9:1 to about 1.2:1, and reacting the intermediate in aqueous solution with from about 1 mole to about 1.5 moles of an epihalohydrin per mole of tertiary amine groups present in said intermediate.

4,501,863

POLYCARBOXYLIC ACID RESINOUS COMPOSITION, ITS PREPARATION AND COATING COMPOSITION CONTAINING THE SAME

Hirotoshi Umemoto; Hisaki Tanabe, both of Kyoto; Mitsuo Yamada, and Shinji Nakano, both of Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Dec. 30, 1983, Ser. No. 567,313
Claims priority, application Japan, Dec. 30, 1982, 57-232900
Int. Cl.[3] C08F 283/00; C08G 63/76; C08L 61/00
U.S. Cl. 525—443 4 Claims

1. A resinous composition for coating use comprising a resin having a resinous acid value derived from polycarboxylic acid whose titration midpoint potential in non-aqueous potentiometric titration is more than −300 mV under the state capable of developing resinous acid value, of 2 to 50 and having a functional group reactive with crosslinking agent.

4,501,864

POLYMERIZABLE COMPOSITIONS COMPRISING POLYAMINES AND POLY(DIHYDROBENZOXAZINES)

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1983, Ser. No. 564,638
Int. Cl.[3] C08G 73/06
U.S. Cl. 525—484 29 Claims

1. A polymerizable composition comprising a poly(3,4-dihydro-3-substituted-1,3-benzoxazine) and a reactive polyamine or polyamine generating compound, wherein the poly(dihydrobenzoxazine) is of number average molecular weight in the range of about 250 to about 2000, with the majority of the individual molecules containing at least two dihydrobenzoxazine groups, and is the reaction product of about 1 equivalent of a primary amine selected from the group consisting of mono- and poly-primary amines, about 1 equivalent of a phenol selected from the group consisting of mono- and poly-phenols having phenolic hydroxy groups with at least one unsubstituted position ortho to such hydroxy groups and about 2 equivalents of formaldehyde, and wherein the reactive polyamine is at least difunctional and its reactive groups are primary or secondary amine.

4,501,865

POLYMERIZATION PROCESS

Joachim König; Carlhans Süling, both of Odenthal, and Siegfried Korte, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 505,655
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225521; Oct. 7, 1982, 3237076
Int. Cl.[3] C08F 2/16
U.S. Cl. 526—71 9 Claims

1. A process for the bead polymerisation or precipitation polymerization of vinyl monomers in heterogeneous aqueous phase comprising adding liquids to the reaction medium for the removal of heat and to regulate the reaction temperature which liquids are chlorohydrocarbon, chlorofluorohydrocarbon or fluorohydrocarbon, are immiscible with the reaction mixture, do not dissolve the polymer under the reaction conditions and the boiling temperatures of which are lower than the technically predetermined reaction temperatures under the polymerization conditions applied, and removing the heat which is released in the reaction system by evaporation of these liquids.

4,501,866

CONTINUOUS METHOD FOR PREPARING HIGH CIS-1,4 POLYBUTADIENE

David M. Roggeman; Shrikant R. Malani, both of Akron, and Jung W. Kang, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 23, 1984, Ser. No. 633,814
Int. Cl.[3] C08F 4/82
U.S. Cl. 526—133 18 Claims

1. A method for preparing high cis-1,4 polybutadiene by a continuous polymerization process which comprises continuously polymerizing 1,3-butadiene in solution under adiabatic conditions, said method comprising the steps of:

(I) feeding continuously to a single agitated polymerization reactor:

(a) a monomer stream comprising 1,3-butadiene in a hydrocarbon solvent;

(b) a preformed π allyl catalyst stream formed by admixing a carboxylated metal oxy borate compound represented by the formulae $(RCOOMO)_3B$ or (RCOO-

$MO)_2B$-OR′ wherein R and R′ are alkyl radicals containing from 7 to 17 carbon atoms and M is nickel or cobalt, an organoaluminum compound, an alcohol, a small amount of 1,3-butadiene and a hydrocarbon solvent; and

(c) a cocatalyst stream comprising a boron trifluoride complex with an alcohol; and

(II) withdrawing continuously from said reactor high cis-1,4 polybutadiene at the same rate as said monomer, preformed catalyst and cocatalyst streams are fed to the reactor.

4,501,867

METHOD FOR PRODUCING A POLYBUTADIENE MATERIAL

Haruo Ueno, Chiba; Hidetomo Ashitaka, Ichihara, and Koichi Nakajima, Chiba, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Oct. 7, 1983, Ser. No. 539,999

Claims priority, application Japan, Oct. 14, 1982, 57-179150

Int. Cl.³ C08L *61/00*

U.S. Cl. 526—136 **16 Claims**

1. A method for producing a polybutadiene material, comprising the steps of:

subjecting a solution containing 1,3-butadiene dissolved in a polymerization solvent to a 1,2-polymerization in the presence of a 1,2-polymerization catalyst consisting essentially of (A) a cobalt catalytic component consisting of at least one cobalt compound soluble in the polymerization solvent, (B) an aluminum catalytic component consisting of at least one organic aluminum halide, (C) a magnesium catalytic component consisting of at least one organic magnesium compound, and (D) a sulfur catalytic component consisting of at least one member selected from the group consisting of carbon disulfide and phenyl isothiocyanate; and isolating the resultant polybutadiene material from the 1,2-polymerization mixture.

4,501,868

SUPERIOR SOLVENT BLENDS FOR SYNTHESIS OF ACRYLIC RESINS FOR HIGH SOLIDS COATINGS

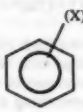
Constantine J. Bouboulis, Union, and Irving Kuntz, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 28, 1982, Ser. No. 393,080

Int. Cl.³ C08F *2/06, 220/20*

U.S. Cl. 526—208 **12 Claims**

1. An improved process for forming acrylic copolymer resins which comprises effecting a polymerization reaction by contacting under polymerization conditions, a monomer mixture comprising from about 5 to 30 wt.%, based on said monomer mixture, of at least one hydroxy-substituted alkyl(meth)acrylate monomer and from about 5 to 95 wt.%, based on said monomer mixture, of at least one non-hydroxy substituted alkyl(meth)acrylate monomer, in the presence of a free radical initiator and a solvent therefor, said solvent comprising a blend of from about 35 to 80 wt.%, methyl isobutyl ketone and, as the balance thereof, at least one alkyl-substituted benzene solvent comprising at least one aromatic compound of the formula:



wherein n is an integer of from 1 to 4, and X is in each instance in which it appears independently selected from the group consisting of straight and branched-chain alkyl of from 1 to 4 carbon atoms, with the proviso that when n is 1, the X groups must contain a total of at least 2 carbon atoms and with the further proviso that when n is 2 or higher, the X groups must contain a total of at least 3 carbon atoms, and mixtures of the foregoing aromatic compounds, said hydroxy substituted alkyl(meth)acrylate monomer and said non-hydroxy substituted alkyl(meth)acrylate monomer comprising at least about 60 wt.% of said monomer mixture.

4,501,869

CROSS LINKABLE FLUORINE-CONTAINING POLYMER

Masayoshi Tatemoto, Ibaraki; Masahiko Oka, Ohtsu; Hideo Kano, Settsu; Masayasu Tomoda, Ohtsu, and Yutaka Ueta, Toyonaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 26, 1983, Ser. No. 517,334

Claims priority, application Japan, Jul. 27, 1982, 57-130781

Int. Cl.³ C08F *214/16*

U.S. Cl. 526—249 **28 Claims**

1. An easily cross linkable fluorine-containing polymer comprising: (1) a polymeric chain comprising one or more polymer segments, at least one polymer segment of which consists of units of at least one fluorine-containing ethylenically unsaturated compound having 2 to 8 carbon atoms, or units of said fluorine-containing ethylenically unsaturated compound and at least one other monomer selected from the group consisting of a fluorine-free ethylenically unsaturated compound having 2 to 4 carbon atoms and a fluorine-containing diene having 4 to 8 carbon atoms, (2) at least one bromine atom linked to a terminal carbon atom liberated from a brominated compound of the formula: RBr_x, wherein R is a saturated hydrocarbon residue and x is a number corresponding to the bonding valency of the residue, in an amount of 0.001 to 10% by weight based on the polymer weight and (3) a fragment of the brominated compound excluding said liberated bromine atom therefrom bonded to the polymeric chain, said polymer being prepared by polymerizing said fluorine-containing ethylenically unsaturated compound with or without said other monomer in the presence of a radical producing source and said brominated compound in at least one step.

4,501,870

FINE PARTICLES OF POLYVINYL CHLORIDE AND PROCESS FOR PRODUCING THE SAME

Kunizoh Kidoh; Hideki Wakamori; Fujio Suzuki, and Takao Iwasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1984, Ser. No. 614,223

Claims priority, application Japan, May 24, 1983, 58-91028

Int. Cl.³ C08F *114/06*

U.S. Cl. 526—344.1 **2 Claims**

1. A process for producing fine particles of polyvinyl chloride, which comprises subjecting vinyl chloride to bulk polymerization in the presence of a dispersion stabilizer under gentle stirring without causing sedimentation or agglomeration of the polymer particles formed, wherein the polymerization is terminated at a polymerization yield of 5 to 30% thereby to obtain fine particles of polyvinyl chloride comprising substantially discrete spherical particles with particle sizes of 0.2 to 2 microns, which are characterized in that a plastisol prepared by adding 80 parts by weight of dioctyl phthalate to 100 parts by weight of said particles has a viscosity of 50,000 centipoise or less (measured by a B-type viscometer, No. 4 rotor, 12 rpm, 25° C.).

4,501,871

PROCESS FOR THE PRODUCTION OF ANHYDRIDE-GROUP- OR CARBOXYL-GROUP-CONTAINING GRAFT COPOLYMERS OF POLYSACCHARIDE ESTERS

Herbert Barti, Odenthal; Heinrich Alberts, Cologne, and Klaus Schuster, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 325,845, Nov. 30, 1981, abandoned. This application Dec. 20, 1983, Ser. No. 563,660

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045487

Int. Cl.³ C08G *63/00*; C08L *1/10, 3/06, 5/00*

U.S. Cl. 527—313 2 Claims

1. A process for producing a graft copolymer which comprises radically polymerizing in homogeneous solution 0.1 to 2 parts by weight of a monomer mixture of

(a) 1 mole of a vinyl ester of a C_1–C_{18}-monocarboxylic acid and

(b) from 0.5 to 3 moles of maleic acid anhydride and/or a semiester of maleic acid and/or fumaric acid with aliphatic C_1–C_{24}-monoalcohols in the presence of one part by weight of a polysaccharide ester of an aliphatic C_1–C_5-monocarboxylic acid and in the presence of a catalytic amount of a radical initiator selected from the group consisting of organic peroxides, peroxydicarbonates, readily decomposable azo compounds and short-wave radiation.

4,501,872

MOISTURE CURABLE COMPOSITIONS CONTAINING REACTION PRODUCTS OF HYDROPHOBIC POLYOLS AND ORGANOSILICON-CONTAINING MATERIALS

Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1983, Ser. No. 462,573

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.³ C08G *77/06, 77/04*

U.S. Cl. 528—18 18 Claims

1. A liquid composition comprising a reaction product prepared by reacting:

(A) at least one hydrophobic polyol; and

(B) an organosilicon-containing material comprising

(1) at least one organosilicon-containing substance free of functional groups attached to carbon and essentially free of alkali metal ions, having atoms bonded directly to Si, all of said atoms being selected from O, N, and/or Cl, said organosilicon-containing substance additionally having moieties directly bonded to Si which are displaceable by reaction with water and/or alcohol, wherein at least a part of said organosilicon-containing substance is hydrolyzed to a compound or a mixture of compounds, said compound or mixture of compounds containing a residual amount of said moieties directly bonded to Si which are displaceable;

(2) optionally a nonfunctional organosilane, a hydrolyzed nonfunctional organosilane, or a mixture thereof; and

(3) optionally a functional organosilane, a hydrolyzed functional organosilane, or a mixture thereof;

wherein said reaction product has a ratio of milliequivalents of said residual moieties which are displaceable to milliequivalents of hydroxyl moieties from said polyol greater than 1, is capable of self curing to a continuous film in the presence of moisture, and remains ungelled when subjected to a three-step gel test consisting of (1) heating a 10 gram sample of said reaction product in a glass jar covered with a cap at 149° C. for 120 minutes, followed by (2) heating said sample at 149° C. for 120 minutes, in the presence of 0.5 grams of stannous octoate in said glass jar with a vent hole covered by a piece of masking tape in said cap, followed by (3) repeating step 2 except that no additional stannous octoate is introduced into said sample and said heating is conducted at a temperature of 204° C.

4,501,873

PREPARATION OF POLYAMINES BY HYDROLYZING A POLYISOCYANATE IN THE PRESENCE OF AN ISOCYANATE-REACTIVE COMPOUND WITH WATER

Werner Rasshofer, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 555,241

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244913

Int. Cl.³ C08G *18/82*

U.S. Cl. 528—48 15 Claims

1. A process for the preparation of relatively high molecular weight aromatic polyamines linked by urethane groups to segments of relatively high molecular weight compounds comprising

(a) hydrolyzing

(i) a polyisocyanate having an isocyanate content of from 21 to 52.5 wt. % which polyisocyanate is not a preformed isocyanate prepolymer or semiprepolymer in presence of

(ii) an isocyanate-reactive group-containing compound having a molecular weight of from 400 to 10,000 at an isocyanate to isocyanate-reactive group equivalent ratio of from 0.1 to 5 mixed with

(iii) water in an amount such that the equivalent ratio of water to isocyanate groups is greater than 1 and

(iv) a basic catalyst and

(b) isolating the product amine from the reaction mixture of (a).

4,501,874

2,3-EPOXY CARBAMATES

Joseph W. Hanafin, Framingham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1984, Ser. No. 606,055

Int. Cl.³ C08G *59/26, 59/28*

U.S. Cl. 528—103 42 Claims

1. A novel compound comprising one or more 2,3-epoxyalkyl carbamate moieties; wherein the carbamate nitrogen atom is tertiary, and the carbamate nitrogen atom is substituted by a alicyclic or aliphatic moiety or is part of a heterocyclic ring, wherein the heterocyclic ring can contain an oxygen or sulfur atom or may contain a tertiary nitrogen atom of a 2,3-epoxyalkyl carbamate moiety; or wherein two or more 2,3-epoxyalkyl carbamates are linked by an aliphatic or alicyclic moiety.

4,501,875

POLYCARBONATE FROM CARBONYL HALIDE, BISCHLOROFORMATE AND DIHYDRIC PHENOL

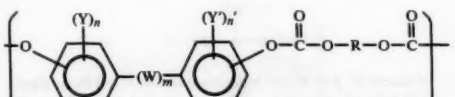
Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 23, 1982, Ser. No. 410,311

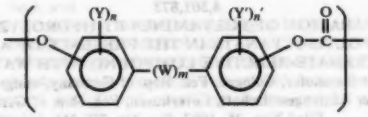
Int. Cl.³ C08G *63/62*

U.S. Cl. 528—196 14 Claims

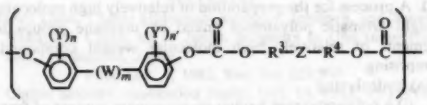
1. High molecular weight thermoplastic aromatic polycarbonate exhibiting improved processability consisting essentially of at least one recurring structural unit represented by the general formula



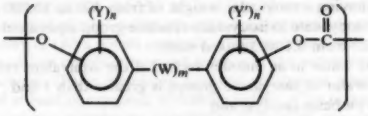
and at least one recurring structural unit represented by the general formula



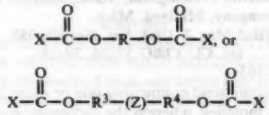
or at least one recurring structural unit represented by the general formula



and at least one recurring structural unit represented by the general formula



derived from (i) a carbonyl halide carbonate precursor; (ii) at least one dihydric phenol; and (iii) at least one bishaloformate selected from bishaloformates represented by the general formulae

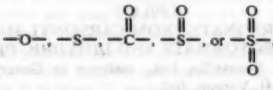


wherein:

Y is independently selected from halogen, monovalent hydrocarbon or monovalent hydrocarbonoxy radicals,

Y' is independently selected from halogen, monovalent hydrocarbon or monovalent hydrocarbonoxy radicals,

W is selected from divalent hydrocarbon radicals,

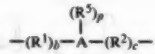


n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive,

m is either zero or one,

X is independently selected from chlorine or bromine radicals,

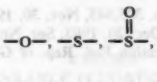
R is selected from alkylene radicals, cycloalkylene radicals, or divalent radicals represented by the general formula



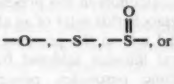
wherein R^1 and R^2 are independently selected from alkylene radicals, R^5 is independently selected from alkyl radicals, A represents a cycloalkylene radical, the letters b and c are independently selected from zero or one, with the proviso that the sum of b and c is at least one, and p represents a whole number having a value of from zero up to the number of replaceable hydrogen atoms present on A,

R^3 and R^4 are independently selected from alkylene radicals, and

Z is selected from the following divalent radicals



the $-(R^6)_d-Ar-(R^7)_e-$ radical wherein Ar represents a divalent mono, di- or polynuclear aromatic residue, R^6 and R^7 are independently selected from alkylene radicals, and the letters d and e are independently selected from zero or one, or a divalent organic aliphatic hetero noncyclic radical containing at least one carbon atom and at least one hetero group selected from



4,501,876

FILM-FORMING POLY(CONJUGATED POLYMETHINE-TYPE)DYE

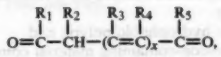
George E. Zahr, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 514,890, Jul. 18, 1983, abandoned. This application Mar. 1, 1984, Ser. No. 585,107

Int. Cl.³ C08G *12/08*

U.S. Cl. 528—232 **23 Claims**

1. A film-forming poly (conjugated polymethine-type) dye which is the polycondensation reaction product in the presence of a strong protic acid of an aromatic polyamine and a dicarbonyl compound corresponding to the formula:



in which R_1 and R_5 are independently selected from the group consisting of —H, C_{1-4} alkyl, phenyl, C_{7-12} aralkyl, C_{7-12} alkaryl and C_{5-8} cycloalkyl and, when R_1 and R_5 are combined, C_{2-5} alkylene, thus forming a C_{5-8} member ring, R_2, R_3 and R_4 are independently selected from the group consisting of —H, C_{1-3} alkyl and halogen, and χ is either 0 or an integer of 1 to 3.

4,501,877

HIGHER MOLECULAR WEIGHT POLYESTERS FROM DIACID ANHYDRIDES AND CYCLIC ALKYLENE CARBONATES

David R. Fagerburg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,391

Int. Cl.³ C08G *63/00*

U.S. Cl. 528—271 **7 Claims**

1. The process for preparing a polyester of increased molecular weight, comprising contacting in a reaction system at from about 100° C. to about 230° C. at least one diacid anhydride with at least one cyclic alkylene carbonate, wherein the reaction system contains less than about 0.1% by weight of water and the percent of opened anhydride rings is less than 5.0 percent, for a sufficient period to give an inherent viscosity of above about 0.1 as determined according to ASTM D2857-70 procedure, at 25° C. using a polymer concentration of 0.5% by weight in 60/40 by weight of phenol/tetrachloroethane.

4,501,878

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT POLYESTERS

L. Jane Adams, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,371
Int. Cl.³ C08G *63/04, 63/38*
U.S. Cl. 528—286 9 Claims

1. In the process for the preparation of high molecular weight linear polyester by the steps of

(a) reacting dimethyl terephthalate with a glycol containing up to about 8 carbon atoms in the presence of a transesterification catalyst to form a bis-dihydroxy ester prepolymer,

(b) polycondensing said prepolymer in the presence of one or more phosphorous-containing compounds and a transition metal containing polycondensation catalyst which is active in the presence of said phosphorous compound,

the improvement comprising employing a transesterification catalyst which is substantially inactive in the presence of said phosphorous-containing compound and introducing said phosphorous compound into the polycondensation reaction zone after first polycondensing said prepolymer until a low molecular weight linear polyester having an average degree of polymerization of about 2 to about 10 is obtained and polycondensing in the presence of said phosphorous compound until a linear polyester having an inherent viscosity of about 0.35 to about 0.8 is obtained.

4,501,879

POLYESTERAMIDES AND CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES FORMED THEREFROM

Robert B. Barbee; Roy K. Bass; Burns Davis, all of Kingsport, and Larry A. Minnick, Bluff City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,057
Int. Cl.³ C08G *63/44*
U.S. Cl. 528—288 40 Claims

1. A novel polyesteramide having improved gas barrier properties which comprises the reaction product of

(A) a diamine having 2 to about 20 carbon atoms;

(B) a diol containing up to about 24 carbon atoms; and

(C) a dicarboxylic acid component consisting essentially of

(i) about 5 to 100 mole percent of a first, heteroatom-containing dicarboxylic acid of the formula

$$HO_2CCH_2X(RX)_yCH_2CO_2H$$

wherein X represents —O—, —S—, or

y is 0 or 1, and R represents an aromatic moiety comprising 6 to about 24 carbon atoms, and

(ii) 0 to about 95 mole percent of a second dicarboxylic acid containing up to about 24 carbon atoms,

wherein component (A) comprises about 10 to 90 mole percent of the total of components (A) and (B) in said polyesteramide.

8. The polyesteramide of claim 1 wherein said diol comprises an aliphatic glycol.

4,501,880

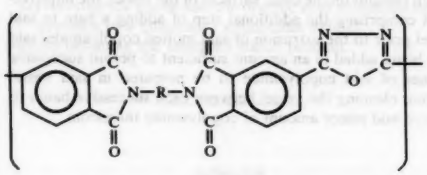
COPOLYOXADIAZOLE-IMIDE CONTAINING 5-TERTIARY BUTYL PHENYLENE MOIETY

James R. Stephens, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 424,607, Sep. 27, 1982, abandoned. This application Dec. 30, 1983, Ser. No. 567,083
Int. Cl.³ C08G *73/08*
U.S. Cl. 528—322 52 Claims

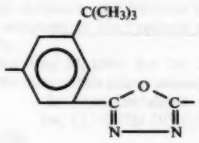
1. A moldable copolyoxadiazole-imide comprising the following repeating structural units:

A.



and

B.



wherein the mole ratio of A to B is about 1:99 to about 99:1 and wherein R is an aliphatic or aromatic radical.

4,501,881

PREPARATION OF POLYAMIDE BY CONTACTING DIAMINE, DINITRILE, WATER, DICARBOXYLIC ACID

Janice L. Greene, Chagrin Falls, and Roman Loza, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 5, 1982, Ser. No. 365,808
Int. Cl.³ C08G *69/00*
U.S. Cl. 528—336 10 Claims

1. A process for preparing a polyamide comprising contacting a diamine, a dinitrile and water in the presence of a dicarboxylic acid.

4,501,882

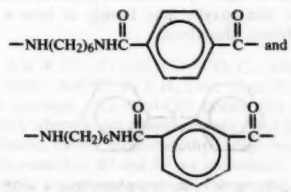
BATCH PROCESS FOR PREPARING 6TA/6IA COPOLYMERS HIGH IN 6TA

LeMoyne W. Plischke, Lillian, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 16, 1983, Ser. No. 552,531
Int. Cl.³ C08G *69/28*
U.S. Cl. 528—336 11 Claims

1. In a process for preparing successive batches of a random copolyamide consisting essentially of the following recurring units

(a)



wherein each batch of said copolyamide is prepared by heating an aqueous solution consisting essentially of a mixture of hexamethylene diammonium terephthalate (6TA salt) and hexamethylene isophthalate (6IA salt) in a weight ratio of 6TA salt to 6IA salt ranging from about 45:55 to 80:20 in a vessel closed to the atmosphere wherein said heating is conducted under controlled conditions of time, temperature and pressure to remove water from the vessel, effect polymerization of said salts and provide said copolyamide in the molten state in the vessel and wherein said copolyamide in the molten state is then extruded from the vessel except for a minor amount thereof which remains on the inner surfaces of the vessel, the improvement comprising the additional step of adding a base to said vessel prior to the extrusion of said molten copolyamide, said base being added in an amount sufficient to permit successive batches of said copolyamide to be prepared in said vessel without cleaning the vessel between each successive batch to remove said minor amount of copolyamide therefrom.

4,501,883

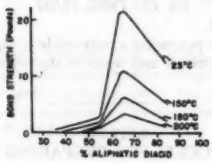
BONDABLE POLYAMIDE

George A. Walrath, Scotia, and Scott D. Smith, Ballston, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

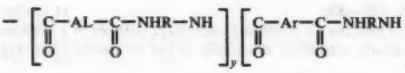
Division of Ser. No. 311,385, Oct. 14, 1981, Pat. No. 4,420,535. This application Jul. 15, 1983, Ser. No. 514,035

Int. Cl.³ C08G 69/26, 18/34, 18/68

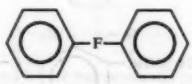
U.S. Cl. 528—340 **64 Claims**



1. A self bondable copolyamide having the recurring unit



where AL is the divalent hydrocarbon residue of an unsubstituted aliphatic dicarboxylic acid having at least 6 carbon atoms, R is tolylene, phenylene,



where F is O, CH_2, or SO_2, Ar is p-phenylene, y is 35 to 80% of the recurring units and z is 65 to 20% of the recurring units.

4,501,884

PROCESS FOR THE PRODUCTION OF OPTIONALLY BRANCHED POLYARYLENE SULPHIDE WITH PIPERAZINONE SOLVENT

Edgar Ostlinning, Duesseldorf, and Karsten Idel, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,883

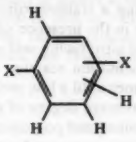
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241514

Int. Cl.³ C08G 75/14

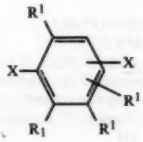
U.S. Cl. 528—388 **9 Claims**

1. A process for the production of high molecular weight polyarylene sulphide from

(a) 0 to 100 mol % of at least one dihalogen aromatic compound corresponding to the formula


(I)

and from 100 to 0 mol % of at least one dihalogen aromatic compound corresponding to the formula


(II)

wherein

X represents meta- or para-positioned chlorine or bromine relative to each other, and

R^1 is the same or different and represent hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two radicals of R^1 link together to form an aromatic ring or heterocyclic ring having 1–3 nitrogen, oxygen or sulfur heteroatoms, and one radical R^1 is always different from hydrogen, and

(b) from 0 to 3 mol %, based on the total of components (a) and (b), of a tri- or tetra-halogen aromatic compound corresponding to the formula

$$ArX_n \quad \text{(III)}$$

wherein

Ar represents an aromatic ring or heterocyclic ring having 1–3 nitrogen, oxygen or sulfur heteroatoms,

X represents chlorine or bromine, and

n represents 3 or 4, and

(c) alkali sulphide, or a mixture thereof with alkali hydroxide, the molar ratio of (a+b):c ranging from 0.85:1 to 1.15:1, and,

(d) a piperazinone organic solvent with the molar ratio of alkali sulphides (c) to organic solvent (d) ranging from 1:2 to 1:15, and the reacting temperature is from 160° to 265° C.

4,501,885

DILUENT AND INERT GAS RECOVERY FROM A POLYMERIZATION PROCESS

Fred T. Sherk, and Janet L. Inkrott, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

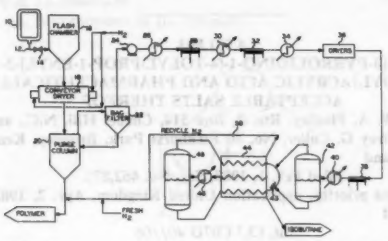
Filed Oct. 14, 1981, Ser. No. 311,479

Int. Cl.³ C08F 6/06

U.S. Cl. 528—501 **4 Claims**

1. In a polymerization process wherein a slurry of olefin polymer solids and diluent is passed from the polymerization

zone into a flash zone wherein a substantial portion of the diluent is separated from the polymer and the polymer solids containing residual amounts of diluent are passed to a purge zone wherein said polymer solids are contacted with a heated noncombustible gas to separate additional amounts of the diluent therefrom, the improvement comprising cooling and compressing the vaporous effluent from the purge zone to



produce a mixed stream comprising liquid comprising said diluent and vapor comprising said noncombustible gas, separating said liquid stream and said vapor stream, using both said vapor stream and said liquid stream as heat exchange fluids for a portion of the cooling to which the mixed stream is subjected, recovering said diluent stream, and using said vapor stream as at least a portion of the noncombustible gas in the purge zone.

4,501,886

CELLULOSIC FIBERS FROM ANISOTROPIC SOLUTIONS

John P. O'Brien, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 406,533, Aug. 9, 1982, Pat. No. 4,464,323. This application Aug. 1, 1983, Ser. No. 519,100

Int. Cl.³ C08B *3/06, 3/20*

U.S. Cl. 536—57 **6 Claims**

1. Cellulose tricetate fibers having at least 42.5% by weight acetyl groups, an inherent viscosity in hexafluoroisopropanol at 0.5 g/dl of at least 5, a tenacity of at least 10 dN/tex, an orientation angle of 35° or less, an AACS value of at least 130 and an exotherm in their DSC scan in the range between 190° and 240° C.

5. Regenerated cellulose fibers having a tenacity of at least 12.4 dN/tex and a modulus of at least 220 dN/tex, and an orientation angle of 18° or less.

4,501,887

PREPARING CELLULOSE ETHERS IN A DIMETHOXYETHANE/(DISPERSING AUXILIARY) MEDIUM

Wolfgang Kornrumpf, Eppstein-Bremthal; Eberhard Perplies, Walluf; Josef Hilbig, Taunusstein, and Utz-Hellmuth Felcht, Bad Soden - Neuenhain, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,233

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306621

Int. Cl.³ C08B *11/04, 11/08, 11/12, 11/193*

U.S. Cl. 536—84 **17 Claims**

1. In a process for preparing a cellulose ether from cellulose and etherifying agent in a reaction medium comprising base and inert organic solvent, the improvement wherein the inert organic solvent is an admixture of dimethoxyethane with at least one further organic solvent selected from the group consisting of alkanol, alkane diol and alkoxy alkanol, the admixture comprising from 0.1 to 50 percent by weight of the other organic solvent, based on the weight of the admixture.

4,501,888

PROCESS FOR PRODUCING ESTERS OF CARBOHYDRATE MATERIALS

James C. Schmidt, Champaign, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 24, 1984, Ser. No. 573,789

Int. Cl.³ C08B *31/04*

U.S. Cl. 536—110 **17 Claims**

1. A process for esterifying a starch including the steps of:
(a) dispersing a starch in an organic acid;
(b) contacting the starch with an organic acid anhydride; and,
(c) reacting the starch and the organic acid anhydride in the presence of a quaternary ammonium halide,
thereby obtaining the esterified starch product.

4,501,889

MORPHOLINE COMPOUNDS PREPARED VIA PHOSPHATE CATALYSTS

James E. Wells, Ardmore, and Victoria Eskinazi, Boothwyn, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 24, 1982, Ser. No. 381,233

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.³ C07D *295/02*

U.S. Cl. 544—106 **6 Claims**

1. A process which comprises converting a diglycolamine compound to a morpholine compound at a temperature in the range of about 285° C. to 420° C., and in the presence of a catalyst selected from the group consisting of the pyrophosphate and the monohydrogen and dihydrogen phosphate of strontium.

4,501,890

TRANS-(±)-2,4,6-SUBSTITUTED-5,5A,6,7,8,9,9A,10-OCTAHYDRO-PYRIMIDO[4,5-g]QUINOLINES

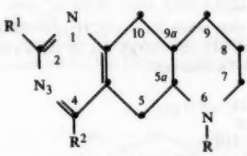
Cynthia L. Nichols, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1983, Ser. No. 535,503

Int. Cl.³ C07D *487/17, 215/00;* **A61K** *31/505*

U.S. Cl. 514—267 **29 Claims**

1. A trans-(±)-2,4,6-permissibly substituted octahydropyrimido[4,5-g]quinoline of the formula:



I

wherein R is H, CN, C_{1-3} alkyl O—CO, C_{1-3} alkyl or allyl; R^1 is NH_2, NHR^3, NR^4R^5, R^2 is H, CH_3, Cl or Br; R^3 is methyl, ethyl or n-propyl, C_{1-3} alkyl-CO, phenyl-CO or substituted phenyl-CO, wherein said substituents are 1 or 2 members of the group: chloro, fluoro, bromo, methyl, ethyl, methoxy, ethoxy and trifluoromethyl; R^4 and R^5 are individually methyl, ethyl or n-propyl; and pharmaceutically acceptable acid addition salts thereof.

4,501,891
METHOD OF FORMING A SOLUTION OF PAPAVRINE CARBANION

André Buzas, 25, Rte. de Versailles, 91570 Bievres, and Gilbert Lavielle, Orleans, both of France, assignors to André Buzas, France

Continuation-in-part of Ser. No. 169,180, Jul. 15, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 348,147
Claims priority, application United Kingdom, Jul. 19, 1979, 7925275
Int. Cl.³ C07D *217/20*
U.S. Cl. 546—149 3 Claims

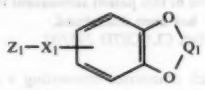
1. A method of forming a solution having papaverine carbanion, said method consisting essentially of reacting, in a solvent, papaverine with an agent selected from the group consisting of butyl-lithium, a lithium alkyl amide, sodium amide and potassium amide.

4,501,892
PYRIDYL BENZENEDIOLS

Gordon L. Bundy, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 28, 1982, Ser. No. 402,515
Int. Cl.³ C07D *405/04, 405/06, 405/12;* A61K *31/335*
U.S. Cl. 546—270 12 Claims

1. A compound of the formula I



I

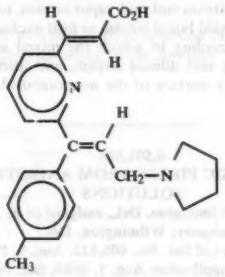
wherein Z_1 is
(a) 4-pyridinyl,
(b) 3-pyridinyl,
(c) 3-pyridinyl substituted at the 4 position by
(1) methyl,
(2) —OCH_3,
(3) —$N(CH_3)_2$, or
(4) —NH_2, or
(5) at the 2, 4, 5, or 6 position by chlorine;
(d) imidazolyl, or
(e) imidazolyl substituted by (C_1–C_3)alkyl;
wherein X_1 is
(a) —$(CH_2)_n$—,
(b) —O—,
(c) —S—,
(d) —S(O)—,
(e) —$S(O)_2$—,
(f) —CH_2—O—,
(g) —CH_2—$N(R_3)$—,
(h) —$N(R_3)$—CH_2—,
(i) —CH(OH)—,
(j) —C(O)—, or
(k) —O—CH_2—;
with the proviso that when X_1 is —$(CH_2)_n$— and n is zero or when X_1 is (b), (c), (d), (e), (f), (g), (h), or (k), Z_1 is (a), (b), or (c), i.e., a pyridinyl substituent;
wherein Q_1 is
(a) —CH(—$(CH_2)_m R_7$)—,
(b) —C(O)—, or
(c) —CHR_5—CHR_6—;
wherein R_5 and R_6 are different and are
(a) hydrogen or
(b) —$COOR_1$;
wherein R_1 is
(a) hydrogen,
(b) a pharmacologically acceptable cation, or
(c) (C_1–C_{12})alkyl;
wherein R_3 is
(a) hydrogen, or
(b) methyl;
wherein R_7 is
(a) hydrogen,
(b) —CH_2OH, or
(c) —$COOR_1$;
wherein m and n are the same or different and are the integers 0 to 4, inclusive;
including, pharmacologically acceptable acid addition salts thereof.

4,501,893
3-{6-[3-PYRROLIDINO-1-(4-TOLYL)PROP-1-ENYL]-2-PYRIDYL}ACRYLIC ACID AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

John W. A. Findlay, Rte. 2, Box 514, Chapel Hill, N.C., and Geoffrey G. Coker, No. 80 Pickhurst Park, Bromley, Kent, England

Filed Feb. 1, 1983, Ser. No. 462,872
Claims priority, application United Kingdom, Apr. 2, 1982, 8203261
Int. Cl.³ C07D *401/06*
U.S. Cl. 546—281 21 Claims

1. The compound of formula (I)



I

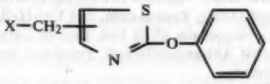
straight and branched lower alkyl (1–4 carbon atoms) esters, and pharmaceutically acceptable salts thereof.

4,501,894
HETEROCYCLIC ALCOHOLS AND THEIR DERIVATIVES

Francois Nezót, Thiais; Pierre Girault, Paris; Jean Tessier, Vincennes, and Jacques Martel, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

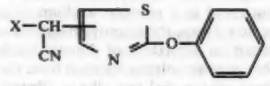
Filed Feb. 25, 1982, Ser. No. 352,256
Claims priority, application France, Feb. 26, 1981, 81 03830
Int. Cl.³ C07D *277/34*
U.S. Cl. 548—186 2 Claims

1. A compound of the formula



wherein X is selected from the group consisting of chlorine, bromine, iodine and —OH.

2. A compound of the formula



wherein X is selected from the group consisting of chlorine, bromine, iodine and —OH.

4,501,895

[HALO-4-(4,5-DIHYDRO-4,4-DIMETHYL-2-OXAZOLYL)-PHENYL]OCTADECAN-OLS AND -ONES

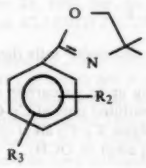
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Division of Ser. No. 492,843, May 9, 1983, Pat. No. 4,469,885. This application Jul. 2, 1984, Ser. No. 627,324

Int. Cl.³ C07D *263/12, 263/14*

U.S. Cl. 548—239 **6 Claims**

1. A compound of the formula:



wherein R_2 is

(a) halogen; or

(b) trifluoromethyl;

wherein R_3 is

(a) —C(O)R_4;

(b) —CH(OH)R_4;

(c) —CH_2R_4; or

(d) —CH=CHR_4;

wherein R_4 is alkyl of 13 to 25 carbon atoms inclusive, and the pharmacologically acceptable base addition salts thereof.

4,501,896

PHENYLMERCAPTOTETRAZOLO- AND NITROINDAZOLO MASKED DEVELOPMENT/IMAGE MODIFIERS

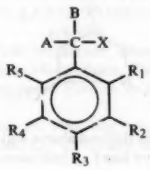
Dennis S. Donald, Mendenhall, Pa., and Ross A. Lee, Webster, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 172,999, Jul. 25, 1980, Pat. No. 4,343,893. This application Aug. 6, 1981, Ser. No. 290,497

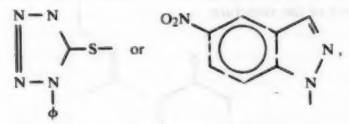
Int. Cl.³ C07D *257/02, 231/54*

U.S. Cl. 548—251 **17 Claims**

1. A masked compound of the formula



wherein A and B each represents hydrogen, alkyl, carboxyalkyl or alkyl carboxyalkyl, said alkyl moiety comprising 1–3 carbon atoms; each of R_1 to R_5 is a member selected from the group consisting of hydrogen, halogen, —CF_3, cyano, or nitro group, X is a radical with one of the following structures:



such that either 1-phenyl-5-mercaptotetrazole or 5-nitroindazole, is released by electron transfer: and wherein the R_1 to R_5-substituted ring has an electron withdrawing effect designated by a Hammet sigma function value of $\sigma = 0.50$ to 1.00.

4,501,897

PROCESS FOR THE PREPARATION OF E-ISOMERS OF 1-CYCLOHEXYL-2-(1,2,4-TRIAZOL-1-yl)-1-PENTEN-3-ONE DERIVATIVES

Wolf Reiser; Hans-Ludwig Elbe, both of Wuppertal, and Peter Feyen, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

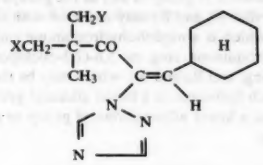
Filed Aug. 16, 1983, Ser. No. 523,537

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231205

Int. Cl.³ C07D *249/08*

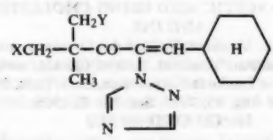
U.S. Cl. 548—262 **11 Claims**

1. A process for the preparation of an E-isomer of 1-cyclohexyl-2,2(1,2,4-triazol-1-yl)-1-penten-3-one of the formula



(I)

wherein X and Y independently of one another represent hydrogen or halogen which comprises contacting a mixture of isomers of 1-cyclohexyl-2-(1,2,4-triazol-1-yl)-1-penten-3-one of the formula



(II)

wherein X and Y have the previous indicated meaning, with at least one secondary amine.

4,501,898

PHOTOGRAPHIC DEVELOPMENT INHIBITOR (1H- OR 2H-) INDAZOLYL HYDROQUINONE DERIVATIVES

Shigeo Hirano, and Kei Sakanoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

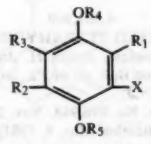
Division of Ser. No. 259,278, Apr. 30, 1981, Pat. No. 4,345,024. This application Jun. 3, 1982, Ser. No. 384,809

Claims priority, application Japan, Apr. 30, 1980, 55-57270

Int. Cl.³ G03C *7/00, 1/40;* **C07D** *231/56*

U.S. Cl. 548—336 **2 Claims**

1. A photographic development inhibitor releasing compound represented by the following formula (I):



wherein X is an indazolyl group which may be substituted with a NO_2 group, a NH_2 group, a CO_2H group, a CN group, a halogen atom, a hydroxy group, an alkyl group having 1 to 12 carbon atoms, an alkoxy group having 1 to 12 carbon atoms, an

alkoxycarbonyl group having 2 to 13 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, a lower alkanoyl group, $-SO_2NR_6R_7$, wherein R_6 and R_7 are independently hydrogen or alkyl having up to 30 carbon atoms, a $-C(=O)NR_6R_7$ group, wherein R_6 and R_7 are independently hydrogen or alkyl having up to 30 carbon atoms, a $NHCOR_{11}$ group where R_8 is an alkyl group having up to 8 carbon atoms, an alkanoyloxy group having up to 11 carbon atoms and which is bonded to the benzene nucleus through the nitrogen atom at the 1-position or 2-position thereof, R_1, R_2 and R_3, which may be the same or different, are each hydrogen, an alkyl group having 1 to 18 carbon atoms, a phenyl or naphthyl group, a halogen atom, a hydroxy group, an alkoxy group having 1 to 19 carbon atoms, a phenoxy group, a lower alkanoyl group, an alkoxycarbonyl group having 2 to 19 carbon atoms, a $NHCOR_9$ group where R_9 is an alkyl group having up to 17 carbon atoms, $-NHSO_2R_{10}$ where R_{10} is an alkyl group having up to 17 carbon atoms, $-SO_2NR_6R_7$, wherein R_6 and R_7 are independently hydrogen or alkyl having up to 30 carbon atoms, an imidazolin-1-yl group or any of the groups described above for X; further R_2 and R_3 may combine with each other to form a ring which is a naphthohydroquinone ring, 5,6-tetramethylenehydroquinone ring or 5,6-(1,3-cyclopentylenyl)-hydroquinone ring; and R_4 and R_5, which may be the same or different, are each hydrogen or a lower alkanoyl group substituted by halogen, a lower alkoxycarbonyl group or a phenoxycarbonyl group.

4,501,899

RESOLUTION OF (+)-1,8-DIETHYL-1,3,4,9-TETRAHYDROPYRANO[3,4-B]INDOLE-1-ACETIC ACID USING CHOLESTERYL ANILINE

Nedumparambil A. Abraham, Dollard-des Ormeaux, and Christopher A. Demerson, Montreal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,985
Int. Cl.³ C07D *491/052*
U.S. Cl. 548—432 **4 Claims**

1. A process for preparing (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid, which comprises dissolving one part by weight of (±)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid and about 1.6 to 1.8 parts by weight of cholesteryl aniline in about 35 to 55 parts by weight of methanol at about 50° to 65° C.; cooling the solution to crystallize the corresponding salt of (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid with cholesteryl aniline; dissolving the latter salt in a mixture of water-immiscible organic solvent and an aqueous mineral acid; separating the water-immiscible organic solvent; and isolating substantially pure (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid from the water-immiscible organic solvent.

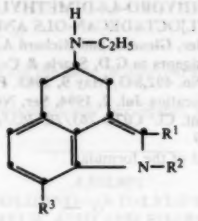
4,501,900

AMINO SUBSTITUTED TETRAHYDROBENZINDOLES

John J. Baldwin, Lansdale; James H. Jones, and George F. Lundell, both of Blue Bell, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 096,948, Nov. 23, 1979, Pat. No. 4,282,240. This application Mar. 4, 1981, Ser. No. 240,350
The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.
Int. Cl.³ C07D *209/90*
U.S. Cl. 548—436 **2 Claims**

1. Compounds of the formula



and pharmaceutically acceptable salts thereof wherein

R^1 is H or halogen

R^2 is H, alkyl having up to six carbon atoms phenyl-C_1-C_3 alkyl or monosubstituted phenyl-C_1-C_3-alkyl wherein the substituent is halogen, C_1-C_3 alkyl or C_1-C_3 alkoxy and

R^3 is H, OH, C_1-C_3 alkyl or OCH_3.

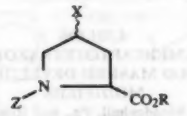
4,501,901

METHOD FOR MAKING SUBSTITUTED PROLINES

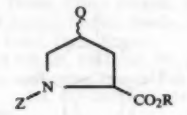
John K. Thottathil, Trenton; Jerome L. Moniot, Chester; David Floyd, Pennington, and Steven Brandt, Plainsboro, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 19, 1983, Ser. No. 533,705
Int. Cl.³ C07D *207/12*
U.S. Cl. 548—532 **7 Claims**

1. A method for making substituted prolines of the structure



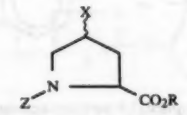
wherein X is phenyl, 1-naphthyl, 2-naphthyl, biphenyl or lower alkyl having up to 7 carbons, R is H, lower alkyl having up to 7 carbons or an alkali metal, Z is a chemically removable N-protecting group and the wavy line ( ) indicates that X is either trans or cis to the proline ring, which comprises reacting a compound of the structure



wherein Z and R are as defined above and Q is Br, tosyloxy or mesyloxy, and the wavy line ( ) indicates that Q is either trans or cis to the proline ring, with an organic copper lithium compound of the structure

XYCuLi

wherein X and Y may be the same or different and X is as defined above and Y is phenyl, 1-naphthyl, 2-naphthyl, biphenyl, lower alkyl having up to 7 carbons or CN, to form a compound of the structure



wherein X is trans to the proline ring where Q is trans to the proline in the starting material or X is cis to the proline ring where Q is cis to the proline ring in the starting material.

4,501,902

N-METHYL PYRROLIDONE-2 PURIFICATION

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 21, 1982, Ser. No. 451,668
Int. Cl.³ C07D *206/267*
U.S. Cl. 548—555 **11 Claims**

1. A process for removing acidic compounds from N-methyl-2-pyrrolidone(NMP); in which NMP containing at least one acidic compound is contacted with an amount of an inorganic compound chosen from among the group consisting of alkaline earth carbonates, alkaline earth hydroxides, alkaline earth oxides and alumina said amount sufficient to reduce the acidic compound content of said solvent thereby producing NMP of reduced acid content and said NMP of reduced acid content is removed from contact with said inorganic compound.

4,501,903

CHLOROMETHYLATION PROCESS

Stanley B. Mirviss, Stamford, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 5, 1983, Ser. No. 511,073
Int. Cl.³ C07D *333/12*
U.S. Cl. 549—29 **8 Claims**

1. A method of producing chloromethylthiophene comprising reacting thiophene with paraformaldehyde, gaseous hydrogen chloride and aqueous hydrochloric acid for a period of time necessary to complete the reaction and wherein the addition rate of the gaseous hydrogen chloride is from about 0.6 mole per mole of thiophene per hour to about 1.5 moles per mole of thiophene per hour.

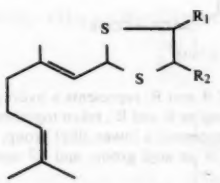
4,501,904

METHYL SUBSTITUTED 2-(2,6-DIMETHYL-1,5-HEPTADIENYL)-1,3-DITHIOLANES

Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,666
Int. Cl.³ C07D *339/06*
U.S. Cl. 549—35 **3 Claims**

1. A methyl substituted 2-(2,6-dimethyl-1,5-heptadienyl)-1,3-dithiolane having the structure:



wherein R_1 and R_2 are the same or different and each represents methyl or hydrogen with the proviso that at least one of R_1 and R_2 is methyl.

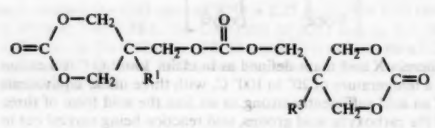
4,501,905

CYCLIC CARBONIC ACID DERIVATIVES

Heinrich Krimm, and Hans-Josef Buysch, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 340,943, Jan. 20, 1982, Pat. No. 4,440,937. This application Nov. 28, 1983, Ser. No. 555,754
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103139; Jan. 30, 1981, 3103138; Jan. 30, 1981, 3103136
Int. Cl.³ C07D *319/06*
U.S. Cl. 549—228 **2 Claims**

1. A cyclic carbonic acid compound of the formula



wherein R^1 and R^3 are independently methyl or ethyl.

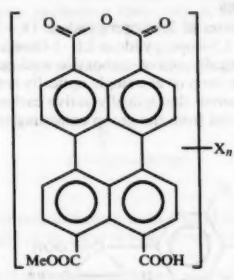
4,501,906

MONOALKALI METAL SALTS OF PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID MONOANHYDRIDE AND PROCESS FOR THEIR MANUFACTURING

Ernst Spietschka, Idstein, and Helmut Tröster, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

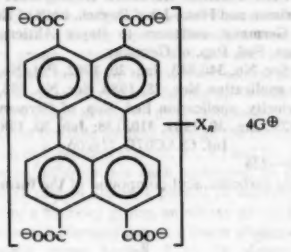
Continuation of Ser. No. 239,909, Mar. 3, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,463
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008420
Int. Cl.³ C07D *311/78*
U.S. Cl. 549—232 **8 Claims**

1. A compound of the formula



wherein Me is potassium, X is chlorine or bromine and n is a nunmber of from zero to 4.

3. A process for preparing a compound as defined in claim 1, which comprises reacting a salt of the formula



wherein X and n are defined as in claim 1 and G^+ is a cation at a temperature of 20° to 100° C. with three molar equivalents of an acid sufficiently strong to set free the acid form of three of the carboxylic acid groups, said reaction being carried out in the presence of at least one molar equivalent of potassium if no G^+ is potassium.

4,501,907

MALEIC ANHYDRIDE PRODUCTION USING HIGH BUTANE FEED CONCENTRATION

Gerald K. Kwentus, Pensacola, Fla., and Michael Suda, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1982, Ser. No. 451,118

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—259 **6 Claims**

1. In a process for producing maleic anhydride by the catalytic vapor phase oxidation of butane, in the presence of a catalyst comprising phosphorus, vanadium and oxygen, the reaction being conducted in a fixed bed tube-type reactor packed with catalyst, the improvement comprising in combination (1) employing a feed concentration of butane to air of about 3–5% by volume at a space velocity from about 364 hr^{-1} to about 536 hr^{-1}; (2) diluting the upstream portion of the catalyst pack to the extent necessary to prevent hot spot runaway; and (3) using a reactor tube of sufficient length, consistent with inside diameter and air flow space within the catalyst packing to permit a single pass conversion of at least about 70% of butane fed to the reactor.

4,501,908

2,3-ISOPROPYLIDENE RIBONIC ACID, 1,4-LACTONES

Colin C. Duke, Dee Why, and Robert J. Wells, Cromer, both of Australia, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

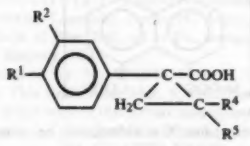
Filed Mar. 1, 1982, Ser. No. 353,755

Claims priority, application United Kingdom, Mar. 12, 1981, 8107737; Feb. 8, 1982, 8203596

Int. Cl.³ C07D *307/77*

U.S. Cl. 549—305 **8 Claims**

1. A lactone ester of 2,3-isopropylidene-D(+)-ribonic acid-1,4-lactone or 2,3-isopropylidene-L(−)-ribonic acid-1,4-lactone and an optically active carboxylic acid, said acid being either in racemic form or as a single optically active enantiometer thereof, wherein the optically active carboxylic acid is a compound selected from the group consisting of a compound of the formula



I

in which R^1 represents hydrogen or a C_1–C_9 alkoxy group, a C_1–C_9 alkylthio group, fluoro, chloro, bromo, a C_1–C_9 alkyl group, a nitro or amino group, R^2 represents hydrogen or a C_1–C_9 alkyl group or R^1 and R^2 together represents a methylenedioxy group and R^4 and R^5 are the same or different and represent fluoro, bromo, chloro or a C_1–C_9 alkyl group;

cis-3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

cis-3-(2,2-dibromovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethyl-cyclopropane carboxylic acid;

2,2-dimethyl-3-(2,2,2-trichloroethyl)-cyclopropane carboxylic acid;

2,2-dimethyl-4,5-benzospiro[2,4]-hepta-4,6-diene-1-carboxylic acid;

cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropane carboxylic acid;

2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methyl lactic acid;

2-(4-chlorophenyl)-3-methyl lactic acid;

2-(4-chlorophenoxy)-3-methylbutanoic acid;

2-(4-difluoromethoxyphenyl)-3-methyl lactic acid;

1-(4-ethoxyphenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(4-bromophenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(4-chlorophenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(3,4-methylenedioxyphenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

2,3-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane carboxylic acid; 1,4,5,6,7,7-hexachloro-8,9,10-trinorborn-5-ene-2-carboxylic acid;

2-chloropropanoic acid; and

2-phenylbutanoic acid.

4,501,909

AMINOPOLYOL DERIVATIVES

Tamejiro Hiyama, and Kazuhiro Kobayashi, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

PCT No. PCT/JP83/00263, § 371 Date Apr. 4, 1984, § 102(e) Date Apr. 4, 1984, PCT Pub. No. WO84/00755, PCT Pub. Date Mar. 1, 1984

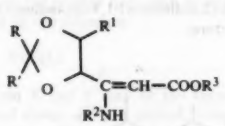
PCT Filed Aug. 12, 1983, Ser. No. 599,440

Claims priority, application Japan, Aug. 12, 1982, 57-139196

Int. Cl.³ C07D *317/72*

U.S. Cl. 549—342 **8 Claims**

1. A compound represented by the general formula

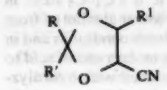


(I)

wherein each of R and R′ represents a hydrogen atom, or an alkyl or aryl group or R and R′, taken together, form an alkylene group, R^1 represents a lower alkyl group, R^2 represents a hydrogen atom or an acyl group, and R^3 represents a lower alkyl group.

5. The compound of claim 1 which is t-butyl (4R, 5S)-3-amino-4,5-(cyclohexylidenedioxy)-2-hexenoate.

8. A process for producing the compound of claim 1, which comprises reacting a compound of the formula

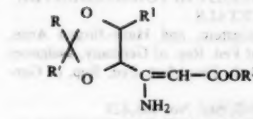


(II)

wherein R, R′ and R^1 are as defined in claim 1, with an acetic acid ester of the formula

$$CH_3COOR^3 \quad \text{(III)}$$

wherein R^3 is as defined in claim 1, and as required, acylating the resulting compound of the formula



(Ia)

wherein R, R′, R^1 and R^3 are as defined above.

4,501,910

PROCESS FOR TRANSFORMING AN ALDEHYDE INTO AN ALKENE

Michel Delmas, Entraygues; Antoine Gaset, Toulouse, and Yves le Bigot, Saint Martin de Londres, all of France, assignors to Agrifurane, S.A., Bon Encountre, France

Filed Oct. 12, 1982, Ser. No. 434,048

Int. Cl.³ C07D *307/28*

U.S. Cl. 549—506 **10 Claims**

1. A process for transforming an aldehyde into a corresponding alkene of the predominantly E type comprising placing an aldehyde in an alcohol solvent in the presence of a phosphoric reagent and a base, said base being selected from the group consisting of mineral bases evincing a basic strength less than or equal to the basic strength of the hydroxide ion, and organic amine bases, and limiting the hydration rate of the reaction medium to a value of approximately 10 moles of water per mole of aldehyde.

4,501,911

ORGANOSILICON-MODIFIED POLYDIENES, PROCESS FOR THEIR SYNTHESIS AND THEIR USE AS EMULSION BREAKERS FOR CRUDE OIL

Götz Koerner, and Christian Weitemeyer, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

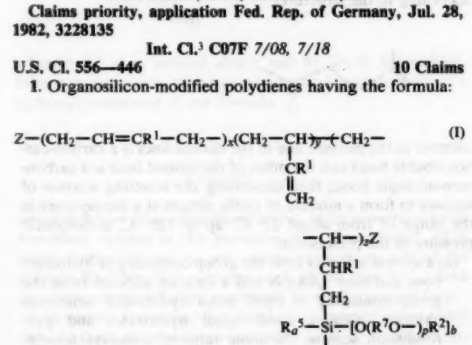
Filed Jul. 19, 1983, Ser. No. 515,369

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228135

Int. Cl.³ C07F *7/08, 7/18*

U.S. Cl. 556—446 **10 Claims**

1. Organosilicon-modified polydienes having the formula:



(I)

in which

Z represents a chain terminating group,

R^1 is a hydrogen or methyl radical,

R^2, R^3, and R^4 are lower alkyl radicals with 1 to 4 carbon atoms, which can be the same or different within the polymeric molecule,

R^5 is a methyl radical or the $O-(R^8O-)_r-R^4$ group;

R^6, R^7, R^8 are alkylene radicals with 2 to 4 carbon atoms,

a is 0 to 2,

$2<b<3$, whereby $0<a+b<3$,

p, q, s ≥ 2,

x, y ≥ 0, and

z ≥ 3

and wherein the C:O ratio of R^6O is 2.25 to 3:1, the C:O ratio of R^7O is 2 to 2.75:1, the C:O ratio of R^8O is 2 to 3:1, the difference in the C:O ratio of R^6O and R^7O is not less than 0.25 and the C:O ratio of R^8O is less than that of R^7O or greater than that of R^6O.

4,501,912

METHOD FOR TREATING GLAUCOMA BY THE TOPICAL ADMINISTRATION OF SELECTIVELY METABOLIZED BETA-BLOCKING AGENTS

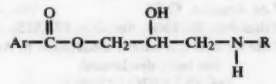
William L. Matier, Liberty, and Sheung-Tsam Kam, Vernon Hills, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 276,657, Jun. 23, 1981, Pat. No. 4,402,974. This application Dec. 13, 1982, Ser. No. 449,197

Int. Cl.³ C07C *69/76;* A01N *37/10;* D01K *31/235*

U.S. Cl. 560—66 **13 Claims**

1. A compound of the formula



wherein R is lower hydroxyalkyl or lower alkynyl and Ar is substituted or unsubstituted aromatic; with the proviso that when Ar is phenyl substituted with 2 or 3 hydroxy groups, or phenyl substituted with acyloxy wherein the acyl portion is alkanoyl of from 2 to about 5 carbon atoms or benzoyl (optionally substituted by halogen, alkoxy, alkyl or hydroxy), R may optionally additionally be isopropyl, t-butyl or dimethoxyphenethyl; or a pharmaceutically acceptable salt thereof.

4,501,913

PROCESS FOR PREPARING ESTERS OF ARYL ALKANOIC ACIDS

Claudio Giordano, Vicenza, and Graziano Castaldi, Briona, both of Italy, assignors to Zambon S.p.A., Vicenza, Italy

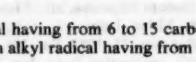
Filed Nov. 1, 1983, Ser. No. 547,632

Claims priority, application Italy, Nov. 3, 1982, 24030 A/82

Int. Cl.³ C07G *69/76*

U.S. Cl. 560—100 **4 Claims**

1. Process for preparing esters of aryl alkanoic acids of formula



where

Ar is an aryl radical having from 6 to 15 carbon atoms,

R is hydrogen or an alkyl radical having from 1 to 3 carbon atoms,

R1 is an alkyl radical having from 1 to 6 carbon atoms or an aryl alkyl radical having from 7 to 12 carbon atoms,

which comprises the oxidation with bromine or iodine of a ketone of formula

where Ar and R have the above mentioned meanings, in the presence of an alcohol having formula R1—OH, where R1 has the above mentioned meanings, characterized in that the oxidation is carried out in the presence of a zind halide.

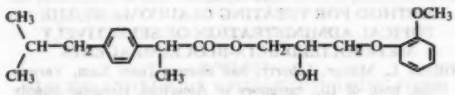
4,501,914

2-HYDROXY-3-(O-METHOXY-PHENOXY)PROPYL 2-(P-ISOBUTYL-PHENYL)-PROPIONATE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Leonardo De Vincentiis, Rome, Italy, assignor to Ausonia Farmaceutici S.r.l., Pomezia, Italy

Filed Nov. 12, 1982, Ser. No. 441,106
Claims priority, application Italy, Mar. 10, 1982, 20073 A/82
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—105 **2 Claims**

1. 2-hydroxy-3-(o-methoxy-phenoxy)propyl 2-(p-isobutyl-phenyl)-propionate of formula (I)



as a new compound.

4,501,915

PREPARATION OF N-ALKYL-MONOSUBSTITUTED CARBAMATES

John J. McCoy, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 30, 1980, Ser. No. 173,515
The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.
Int. Cl.³ C07C *125/065*
U.S. Cl. 560—157 **19 Claims**

1. A process for the preparation of an alkyl-N-monosubstituted carbamic acid ester which comprises reacting an aliphatic primary amine having the formula RNH_2 wherein R is a straight or branched chain alkyl group containing from 1 to 18 carbon atoms, with urea and at least a stoichiometric amount of a monohydric aliphatic alcohol, based on the aliphatic amine and, having from 1 to 18 carbon atoms at a temperature in the range of from about 125° C. to 250° C. in the presence of a catalytic amount of a tertiary amine containing from 1 to 18 carbon atoms and selected from the group consisting of trialkylamines wherein the alkyl groups are the same, triphenylamine, n-dodecyldimethylamine, n-tetradecyldimethylamine, n-hexyldecyldimethylamine, n-octyldecyldimethylamine, N,N,N',N'-tetramethylethylenediamine, 1,4-diazabicyclo[2.2.2]octane, 4(N,N-dimethylamino)pyridine, pyridine, 1,5-diazabicyclo[4.3.0]non-5-ene, 1,8-diazabicyclo[5.4.0]undec-7-ene; methyldiethylamine, butyldimethylamine and benzyldimethylamine.

4,501,916

PROCESS FOR PREPARING ALKYL ESTERS OF C-ALKYL-TARTRONIC OR C-HALOGENALKYL-TARTRONIC ACIDS

Vincenzo Di Toro, Como; Franco Gozzo, and Pier M. Boschi, both of San Donato Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 11, 1982, Ser. No. 338,620
Claims priority, application Italy, Jan. 12, 1981, 19088 A/81
Int. Cl.³ C07C *67/02, 67/22*
U.S. Cl. 560—180 **6 Claims**

1. A process for preparing the alkyl esters of acids selected from the group consisting of C-alkyl tartronic acids and C-halogenalkyl tartronic acids in which the alkanoic ester of a 1-hydroxy-1,1-dicyano-alkane or a 1-hydroxy-1,1-dicyano-alkane substituted by a halogen in the C_1–C_5 alkyl part is reacted with an alcohol R'OH wherein R' is a C_1–C_5 alkyl, in a molar ratio between alkanoic ester and lower alcohol of from 1:4 to 1:10 at 0° C. to 20° C. under anhydrous conditions and in the presence of a strong mineral acid, the molar ratio of acid to alkanoic ester being from 1:1 to 4:1, combined with hydrolyzing the resulting imido ester with two moles of water per mole of ester of the starting dinitrile, at the boiling temperature of the reaction mixture, while distilling to remove 15 to 30% by weight of the reaction mixture, and working up the solid mixture according to conventional techniques to isolate the alkyl ester of C-alkyl or C-halogenalkyl tartronic acid.

4,501,917

PROCESS FOR CARBONYLATING FORMALDEHYDE ACETALS

Hans-Joachim Schmidt, Königstein, and Hans-Jürgen Arpe, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,429
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131355
Int. Cl.³ C07C *69/66*
U.S. Cl. 560—187 **8 Claims**

1. A process for reacting formaldehyde acetals of the formula $RO—CH_2—OR$ in which the two R radicals can be identical or different and denote alkyl, alkoxyalkyl, cycloalkyl or phenylalkyl groups having up to 10 carbon atoms at elevated temperatures and pressures with carbon monoxide in the liquid phase, which process comprises using as catalyst acid organic ion exchange materials having an exchange capacity of more than 0.5 mEq per gram.

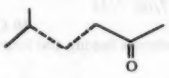
4,501,918

SUBSTITUTED METHYL ISOPROPYL OXOCYCLOHEXANE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Philip T. Klemarczyk, Old Bridge, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 343,571, Apr. 16, 1982, Pat. No. 4,451,403. This application Oct. 12, 1983, Ser. No. 541,265
Int. Cl.³ C07C *67/08*
U.S. Cl. 500—231 **3 Claims**

1. A product produced according to the process of reacting isobutyraldehyde with acetone in the presence of a catalyst selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide, aluminum chloride, sulfuric acid and pyrrolidinium acetate in the presence of an inert solvent thereby forming a mixture of compounds defined according to the structure:



wherein in the mixture one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; then dimerizing the resulting mixture of ketones to form a mixture of cyclic dimers at a temperature in the range of from about 25° C. up to 120° C. atmospheric pressure in the presence of:

(a) a solvent selected from the group consisting of hydrocarbons and inert alkanols and a catalyst selected from the group consisting of alkali metal hydroxides, aluminum chloride, alkaline earth metal hydroxides and pyrrolidinium acetate, the mole ratio of isobutyraldehyde:acetone varying from about 1.5:0.5 up to 0.5:1.5 isobutyraldehyde:acetone, the reaction temperature for the reac-

tion of isobutyraldehyde with acetone varying from about 25° C. up to about 120° C.; and then

(b) reacting the resulting unsaturated ketone mixture with hydrogen in the presence of a hydrogenation catalyst selected from the group consisting of palladium, palladium on a carbon support, palladium on a calcium carbonate support or palladium on a barium sulfate support at a hydrogen pressure of from 50 psig up to 10 atmospheres, the mole ratio of hydrogen:ketone dimer reactant being in the range of from 1:1 hydrogen:ketone up to about 3:1 hydrogen:ketone, the reaction being carried out in an inert solvent and the reaction temperature varying from about 20° C. up to about 100° C.

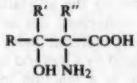
4,501,919

PROCESS FOR THE PRODUCTION OF SERINE DERIVATIVES

Melvin V. Koch, Milan, and Ambrogio Magni, Osnago-Como, both of Italy, assignors to Gruppo Lepetit S.p.A., Italy

Filed May 22, 1980, Ser. No. 152,447
Int. Cl.³ C07C *51/353*
U.S. Cl. 562—437 **10 Claims**

1. A process for the production of a serine derivative of the formula



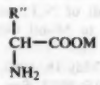
(I)

Wherein R stands for phenyl, substituted phenyl of the groups of methylphenyl, methoxyphenyl, ethoxyphenyl, halogenophenyl, hydroxyphenyl, acetylphenyl, nitrophenyl, cyanophenyl, biphenylyl sulfamoylphenyl and methylsulfonylphenyl, tert-butyl or a heteroaromatic mono- to bi-cyclic radical of the group of pyrrolyl, thienyl, furyl, pyridinyl, pyrazinyl, quinolinyl, isoquinolinyl and phthalazinyl,

R′ represents hydrogen or (C_1–C_4)alkyl and

R″ is hydrogen, (C_1–C_4)alkyl or phenyl,

which comprises reacting an alkali metal salt of a glycine derivative of the formula



(III)

wherein R″ is as defined above and M stands for sodium, lithium or potassium, with two equimolecular proportions of a carbonyl compound of the formula

(II)

wherein R and R′ are as defined above, in an aqueous-organic two-phase system in the presence of a concentrated alkali metal hydroxide and an ammonium quaternary salt of the formula $R'_4{}'' N^+ X^-$, wherein each of the four R‴, which may be equal or different, represents an alkyl group of from 1 to 20 carbon atoms, and X^- stands for a normal anion which derived from an organic or inorganic acid, at a temperature comprised between 0° and 25° C., hydrolizing the obtained intermediate with a strong mineral acid and recovering the compound of formula I in the form of its acid addition salt by common procedures.

4,501,920

PREPARATION OF TRIMETHOXYBENZOATE SALTS AND TRIMETHOXYBENZOIC ACID

Muthunadar P. Periasamy, Creve Coeur, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 426,449
Int. Cl.³ C07C *65/00, 69/76*
U.S. Cl. 562—473 **20 Claims**

1. A process for preparing a salt of 3,4,5-trimethoxybenzoic acid, which comprises:

(a) reacting hydrolyzable tannin with a methylation agent in an alkaline medium under methylation conditions to form methylated tannin, and

(b) hydrolyzing the methylated tannin by reaction thereof with a hydrolysis agent under alkaline hydrolysis conditions to form a 3,4,5-trimethoxybenzoate salt of the hydrolysis agent.

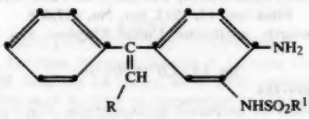
4,501,921

SYNTHESIS OF ALKYLIDENE INTERMEDIATES

Charles W. Ryan, and Bruce A. Slomski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 18, 1982, Ser. No. 442,710
Int. Cl.³ C07C *143/75, 143/86*
U.S. Cl. 564—99 **16 Claims**

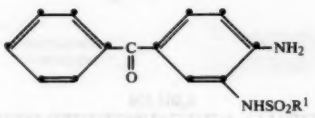
1. A process for preparing a compound of the formula



wherein R is methyl or ethyl;

R^1 is C_3–C_5 branched alkyl or NR^2R^3, wherein R^2 and R^3 are independently C_1–C_3 alkyl, or combine with the nitrogen atom to which they are attached to form pyrrolidino, piperidino or morpholino;

which process comprises reacting a benzoyl intermediate of the formula

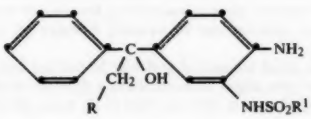


with a Grignard reagent of the formula

RCH_2MgX

wherein X is bromo or chloro;

in an organic solvent suitable for Grignard reactions to form a hydroxy intermediate of the formula



and dehydrating the hydroxy intermediate with dilute acid.

4,501,922

AROMATIC AMINES FROM ALKALI METAL AMIDE AMINATING AGENT AND AROMATIC

Roland E. Grandin, Alburtis, and Barton Milligan, Coplay, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 29, 1983, Ser. No. 509,259
Int. Cl.[3] C07C *85/00*
U.S. Cl. 564—408 2 Claims

1. In a process for forming a mononuclear aromatic amine by reacting a mononuclear aromatic compound with an aminating agent under conditions effective for forming said mononuclear aromatic amine, the improvement which comprises:

forming an intermediate reaction product of a toluene amine by effecting reaction between toluene and an alkali metal amide in the presence of a metallic hydrogenation catalyst group consisting of nickel, rhodium and cobalt, said catalyst being present in a proportion of from 0.1 to 5% based upon the weight of said toluene; and

adding a protonating agent to the reaction product in sufficient amount to form said toluene amine.

4,501,923

PROCESS FOR PREPARING ADRENOCHROME

Deryck F. Boot, Knighton, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 13, 1982, Ser. No. 417,608
Claims priority, application United Kingdom, Sep. 21, 1981, 8128457
Int. Cl.[3] C07D *209/36*
U.S. Cl. 548—484 9 Claims

1. A process for preparing adrenochrome which comprises oxidizing adrenaline or a salt thereof with a persulfate in an aqueous medium at a pH in the range 4 to 8 in the presence of one or more water-soluble salts of bismuth.

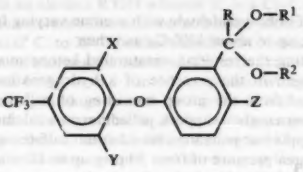
4,501,924

HERBICIDALLY ACTIVE SUBSTITUTED DIPHENYL ETHER ACETALS OR KETALS

Dennis K. Krass, Canal Fulton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1983, Ser. No. 490,818
Int. Cl.[3] C07C *43/30*
U.S. Cl. 568—592 4 Claims

1. A compound represented by the formula:



wherein:

X and Y are hydrogen or halogen provided that at least one of X or Y is halogen;

Z is nitro, halogen or cyano;

R is hydrogen or $—CH_2R^3$ wherein R^3 is hydrogen, halogen, C_1 to C_3 alkyl or haloalkyl, C_1 to C_3 alkoxy or alkylthio, mono or dialkylamino, or cyano; and

R^1 and R^2 are C_1 to C_4 alkyl.

4,501,925

CHEMICAL REACTION PROMOTED BY CATALYTICALLY ACTIVE AMORPHOUS SILICA

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 526,866, Aug. 25, 1983, , which is a division of Ser. No. 356,351, Mar. 9, 1982, Pat. No. 4,414,137. This application Sep. 16, 1983, Ser. No. 533,199
Int. Cl.[3] C07C *2/68*
U.S. Cl. 585—467 20 Claims

1. A process for promoting the alkylation of an aromatic compound, said process comprising contacting said aromatic compound and an alkylating material under conversion conditions with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

4,501,926

CATALYTIC DEWAXING PROCESS WITH ZEOLITE BETA

Rene B. LaPierre, Medford; Randell D. Partridge, Princeton; Nai Y. Chen, Titusville, all of N.J., and Steven S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 379,422, May 18, 1982, Pat. No. 4,419,220. This application Sep. 16, 1983, Ser. No. 533,017
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.[3] C10G *11/05, 45/64;* C07C *5/13*
U.S. Cl. 585—739 11 Claims

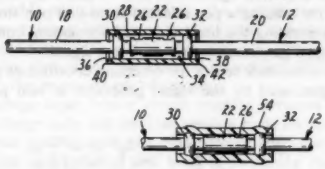
1. A process for dewaxing a hydrocarbon feedstock comprising slightly branched chain paraffins as a waxy component, which comprises contacting the feedstock with a catalyst comprising zeolite beta having a silica:alumina ratio of at least 30:1 and a hydrogenation/dehydrogenation component under isomerization conditions, to isomerize the the waxy component.

4,501,927

APPARATUS AND METHOD FOR SEALING SPLICES IN INSULATED ELECTRICAL CABLES

James A. Sievert, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1983, Ser. No. 528,059
Int. Cl.[3] H02G 15/18
U.S. Cl. 174—93 8 Claims



1. In combination with a pair of insulated cables butt-spliced together, a protective and sealing assembly comprising:

a protective cylindrical sleeve having an internal diameter greater than that of said insulated cables so that said sleeve may freely slide along said cables and having a length substantially longer than said butt-splice so that said sleeve spans said splice and extends beyond said splice along each of said insulated cables; and

at least one toroidal sealing ring disposed at each end of said sleeve, between said sleeve and said cables, and substantially midway between the ends of said sleeve and said butt-splice, said rings when undeformed having an internal diameter less than the diameter of said insulated cables and an external diameter greater than the internal diameter of said sleeve so that said rings seal to the insulation of said cables and to said sleeve and are compressed between said sleeve and said insulated cables.

8. A method of protecting and sealing the splice of two insulated cables having ends to be butt-spliced together comprising the steps of:

rolling at least one toroidally shaped sealing ring having an internal diameter less than that of said insulated cables along each of said cables to points removed from the ends of said cables;

inserting an end of one of said cables through a protective sleeve having an internal diameter less than the external diameter of said sealing rings but greater than that of said insulated cables so that said protective sleeve is free to slide along said cable, said cable being inserted until said protective sleeve is spaced from said end of said cable and disposed between said end of said cable and one of said sealing rings;

splicing said cables;

rolling one of said sealing rings along its respective cable to a position adjacent said splice;

engaging said one sealing ring with one end of said protective sleeve and moving said sleeve in the direction from said splice toward said one ring until the other end of said sleeve is adjacent the end of said splice opposite said one ring whereby said one ring is rolled along the cable with the movement of said sleeve away from said splice to a position intermediate said one end of said sleeve and said splice;

rolling the other of said sealing rings to a position adjacent said splice and said other end of said sleeve; and

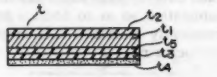
engaging said other sealing ring with said other end of said sleeve and moving said sleeve in the direction from said splice toward said other ring until said sleeve is substantially centered over said splice, thereby compressing said other ring between the inner surface of said sleeve and said cable and causing said other ring to roll away from said splice while said movement of said sleeve from said splice toward said other ring causes said one ring to roll toward said splice resulting in both rings being substantially equally spaced from said ends of said sleeve and substantially equally spaced from said splice.

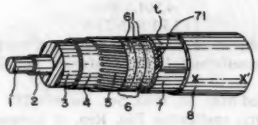
4,501,928

SHIELDING TAPE AND ELECTRIC CABLES USING SAME

Masami Ishitobi, Yokohama, Japan, assignor to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed May 9, 1983, Ser. No. 492,600
Int. Cl.[3] H01B 7/28
U.S. Cl. 174—107 9 Claims





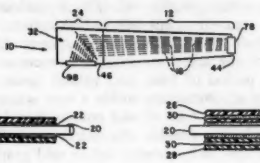
8. An electric cable comprising a core, a sheath of vinyl chloride polymer and a water impermeable layer of a shielding tape longitudinally placed beneath the sheath and composed of a lead foil and a layer of vinyl chloride polymer formed over each surface of the lead foil, the sheath being adhered to the underlying vinyl chloride polymer layer of the shielding tape with a non-reaction-curable adhesive, the shielding tape overlapping itself with its vinyl chloride polymer layers adhered to each other at the lap with the same type of adhesive as above.

4,501,929

MULTICONDUCTOR FLAT CABLE

Edward A. Escallier, Norwalk; Stanley R. Dawson, Corona, and Joseph M. Shaheen, La Habra, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 375,640, May 6, 1982,. This application Mar. 7, 1984, Ser. No. 586,953
Int. Cl.[3] H01B 7/08
U.S. Cl. 174—117 F 2 Claims



1. A multiconductor flat cable, comprising:

(a) an insulation cover sheet;

(b) an insulation base sheet;

(c) multiple runs of a conductor located between said cover and base sheets;

(d) said cover and base sheets being bonded together so as to form a first lamination;

(e) said cover and base sheets of said first lamination being severed into an end portion and a body portion interconnected by exposed portions of said multiple conductor runs;

(f) said end portion of said first lamination being angularly displaced through a predetermined angle relative to, and within the plane of, its body portion so as to form a corre-

sponding angular turn in said exposed portions of said multiple conductor runs;

(g) an insulation cover layer;

(h) an insulation base layer;

(i) said first lamination being located between said cover and base layers such that said cover and base layers overlap said end and body portions of said first lamination and cover said angular turn in said multiple conductor runs; and

(j) said cover and base layers being bonded together and to said cover and base sheets of said end and body portions of said first lamination so as to form a second lamination which permanently maintains said angular turn in said multiple conductor runs.

4,501,930
TELEPRINTER

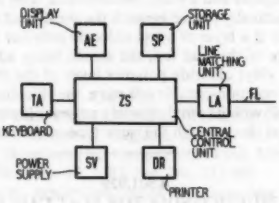
Roman Lutz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,557

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213290

Int. Cl.³ H04L *21/02, 21/04*

U.S. Cl. 178—4 **11 Claims**



1. A teleprinter for input/transmission and/or reception and output of characters representing graphic characters, said characters being coded by teleprinter symbols and each being provided with start and stop elements and being transmitted in accordance with the start-stop operation, said teleprinter comprising a storage means for storing characters of at least one row, and a printer for printing out said graphic characters, said printer printing said characters exclusively row-by-row and returning to a start position before each printout of characters, a means for controlling operation of said printer such that after the occurrence of a predetermined control signal generated whenever no characters are entered or received during a predetermined period of time, said printer generates an output consisting of all characters within a row which have not yet been printed at the time of said control signal, and a display unit for displaying graphic characters comprising at least a portion of a row to be printed before said graphic characters are printed.

4,501,931
COLOR INFORMATION INPUT SYSTEM FOR ELECTRONIC BLACKBOARD

Nobumasa Ohya, Yokohama; Ryusaku Imai, Kawasaki, and Hitoshi Sato, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 24, 1983, Ser. No. 507,497

Claims priority, application Japan, Jun. 26, 1982, 57-110267

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—18 **10 Claims**

1. A color information input system for an electronic blackboard which accepts hand written information generated on an entry area by pens of different colors and displays the hand written information on a display unit, comprising:

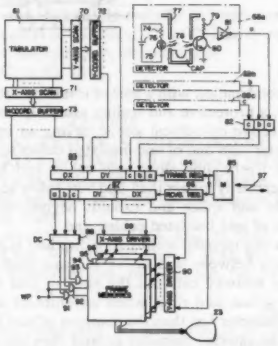
pen stockers for stocking the pens of different colors;

detectors, each of said detectors provided for a corresponding pen stocker and generating a detection signal indicating whether one of said pens is stocked in said corresponding pen stocker;

a color information generator, operatively connected to said detectors, for generating color information in accordance with the detection signal from each of said detectors; and

a holder, for holding a pen selected from said pen stockers while generating the hand written information, comprising a signal generator for generating a signal;

a position coordinate sensor for detecting coordinates of the signal generated by the signal generator in said holder



while on the entry area and generating coordinate information; and

transmitting means, operatively connected to said color information generator, said position coordinate sensor and the display unit, for transmitting color and coordinate information to the display unit, said transmitting means changing the color information transmitted when one of said detectors detects that the selected pen has been taken out of said corresponding pen stocker and, color information for the selected pen is generated by said color information generator and input to said transmitting means.

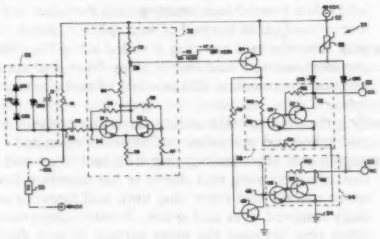
4,501,932
SOLID STATE ELECTRONIC DIAL PULSE RECEIVER CIRCUIT

William T. Mostyn, Jr., Waco, Tex., assignor to Telco Systems, Inc., Waco, Tex.

Filed Aug. 6, 1981, Ser. No. 290,731

Int. Cl.³ H03K *17/60;* **H04Q** *3/04*

U.S. Cl. 179—16 AA **11 Claims**



7. In a load responsive switching device having a load sensing node, a supply voltage node, and a ground reference node, a bistable switching circuit having an input node coupled to said load sensing node and having first and second output nodes, the bistable switching circuit having first and second

operating states wherein the first and second output nodes are placed at the supply voltage node potential and at the ground reference node potential, respectively, in the first operating state of the bistable switching circuit, and the first and second output nodes are placed at the ground reference node potential and at the supply voltage node potential, respectively, in the second oerating state of the bistable switching circuit, and voltage bias means coupled to said sensing node for placing said bistable switching circuit in the second operating state when an external impedance load is connected to said sensing node, and for placing said bistable switching circuit in the first operating state when the external impedance load is disconnected, the improvement comprising:

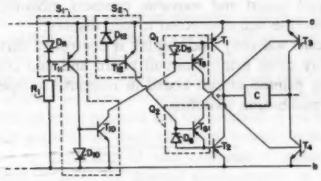
a voltage input limiter circuit coupled between the supply voltage node and the load sensing node for clamping the load sensing node at a bias voltage level corresponding with operation of said bistable switching circuit in its second operating state in response to current flow from said sensing node through an external impedance load having an impedance magnitude less than a predetermined maximum operative level.

4,501,933

TRANSISTOR BRIDGE VOLTAGE RECTIFIER CIRCUIT

Marco Siligoni, Vittuone, and Nazareno Rossetti, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Filed Jun. 28, 1982, Ser. No. 393,088
Claims priority, application Italy, Jun. 30, 1981, 22636 A/81
Int. Cl.³ H04M *1/74*
U.S. Cl. 179—81 R **7 Claims**



1. A transistor bridge voltage rectifier circuit for connecting an electronic circuit of a telephone set to a two-wire telephone line, said circuit comprising first and second bipolar transistors having a first type of conductivity, and third and fourth bipolar transistors having a second type of conductivity which is opposite to that of the first type of conductivity,

the collector of said first transistor being connected to the collector of said second transistor and the collector of said third transistor being connected to the collector of said fourth transistor, said connections respectively forming first and second terminals to which said electronic circuit of said telephone set is connected,

the emitters of said first and the third transistors being connected to a first wire of said telephone line, the emitters of said second and of the fourth transistors being connected to a second wire of said telephone line;

said rectifier circuit further comprising a biasing circuit which comprises:

first and second controlled current gain bipolar transistors having a conductivity of said first type, the emitter and the collector of said first controlled current gain transistor being respectively connected to the base of said first transistor and to the base of said fourth transistor, the emitter and the collector of said second controlled current gain transistor being respectively connected to the base of said second transistor and the base of said third transistor; and,

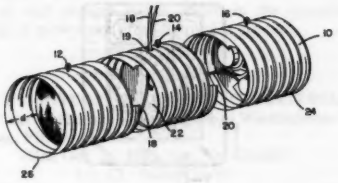
a control circuit for controlling said first and second controlled current gain transistors, said control circuit being sensitive to the polarity of the telephone line voltage and connected to the base of said first controlled current gain transistor and the base of said second controlled current gain transistor.

4,501,934

LOUDSPEAKER SYSTEM

David M. Wiener, Westport, Conn., assignor to W² Vehicle Design and Development, Westport, Conn.

Filed Jul. 18, 1983, Ser. No. 514,876
Int. Cl.³ H05K *5/00*
U.S. Cl. 179—146 E **15 Claims**



1. A loudspeaker system comprising:

a flexible tube;

first and second loudspeakers;

means for mounting said first loudspeaker within one end of said flexible tube, said first loudspeaker oriented to direct sound outwardly from said one end;

means for mounting said second loudspeaker within the other end of said flexible tube, said second loudspeaker oriented to direct sound outwardly from said other end; and

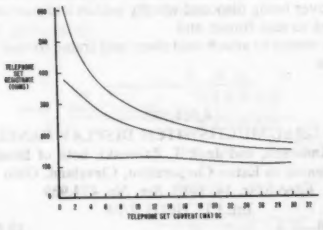
a baffle plate mounted within said tube, intermediate said first and second loudspeakers.

4,501,935

DETECTING A DC NONLINEARITY TERMINATING A NETWORK

Michael A. Gray, Parsippany, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 20, 1983, Ser. No. 515,538
Int. Cl.³ H04M *1/24*
U.S. Cl. 179—175 **8 Claims**



1. A method for determining if a DC nonlinearity terminates a network accessible via an input port, said method comprising the steps of

measuring first and second DC resistances at said input port in response to first and second DC sources, and

indicating the presence of said nonlinearity whenever the difference between said first and second resistances falls within a predetermined range.

4,501,936

PROTECTIVE COVER FOR TELEPHONE

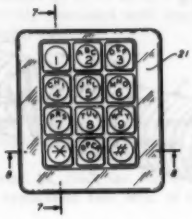
Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 236,757, Feb. 23, 1981, Pat. No. 4,438,300, Ser. No. 261,647, May 7, 1981, abandoned, Ser. No. 286,063, Jul. 23, 1981, abandoned, and Ser. No. 299,509, Sep. 4, 1981, Pat. No. 4,436,965. This application May 25, 1982, Ser. No. 381,905

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.³ H01H 9/02

U.S. Cl. 179—184 16 Claims



1. A protective cover for a push-button array extending through a generally planar surface of a telephone set, each of the push-buttons having indicia thereon, comprising:

a metal frame adapted to fit over the planar surface of the telephone set;

a flexible elastomeric sheet having a grid of upwardly-directed pockets which are adapted to overlie the said push-buttons of the array; each of said pockets being defined by substantially vertical side walls rising above the main plane of said sheet and an upper top portion extending across the tops of said vertical walls, each said pocket thereby extending above the said plane of said sheet and being open at the lower end for receiving each of the buttons of said array and thereby overlying the array of push-buttons on said telephone, said top portion of each said pocket being provided with an upwardly protruding portion, the lateral periphery of which is inward of said vertical side walls, said pockets being elastically depressible independently of one another toward their open ends to permit individual displacement of the underlying telephone set push-buttons received in said pockets; said sheet including a skirt portion extending laterally beyond the side walls of said pockets, and said sheet being continuous between its lateral edges, whereby said entire push-button array may be overlaid by said cover and thereby protected from environmental hazards, said cover being disposed wholly within and permanently secured to said frame; and

adhesive means to attach said sheet and frame to said planar surface.

4,501,937

INTEGRAL MULTISWITCH DISPLAY PANEL

Harry B. Anderson, and Jack J. Zalewski, both of Bradenton, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 14, 1983, Ser. No. 474,939

Int. Cl.³ H01H 9/26

U.S. Cl. 200—5 A 10 Claims

1. A manually-operated integral multiswitch control and display panel comprising:

an open top housing;

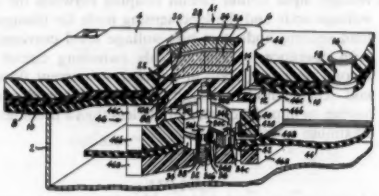
a multiswitch panel closing the top of said housing and having a plurality of openings therein;

a plurality of pushbutton switches, each having an insulating base within said housing and a pushbutton extending up through one of said openings;

a control circuitry printed circuit board within said housing common to said switches and having a plurality of holes therein, one for each of said switches;

each said switch having stationary and movable contact means mounted on the rim of the associated hole and connected to the printed circuit on said board and actuator means within said base comprising an actuating member extending from the associated pushbutton down through said hole for closing and opening said contact means when said pushbutton is actuated;

an electrically energizable multicharacter display mounted within said pushbutton so as to be visible from the top thereof;



a display drive printed circuit board beneath said panel common to said switches and having a plurality of apertures therein, one for each of said pushbuttons;

each said switch having sliding connector means comprising stationary contacts mounted on the rim of the associated aperture and connected to the display drive printed circuit on said board and movable contacts mounted on said pushbutton and connected to said display;

and means whereby said display is controlled through said display drive printed circuit board and said control circuitry printed circuit board in response to operation of said pushbutton switches.

4,501,938

KEYBOARD SWITCH

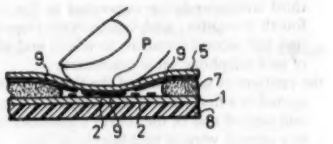
Masahiko Kawauchi, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,579

Claims priority, application Japan, Sep. 4, 1982, 57-50558[U]

Int. Cl.³ H01H 9/00

U.S. Cl. 200—5 A 3 Claims

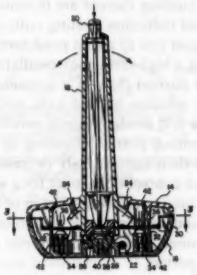


1. A keyboard switch including an insulating sheet provided with a lower-electrode pattern formed by arranging lower electrodes at given distances, each of said lower electrodes being composed of a pair of electrode portions having interfitted teeth spaced from one another; and a second insulating sheet provided with an upper-electrode pattern formed by a plurality of lines of upper electrodes each formed by bar-shaped elements spaced from one another with the bar-shaped elements of each line being offset from the bar-shaped elements of the adjacent lines so that said upper electrodes can cross adjacent teeth of said pair of electrode portions of said lower electrodes.

4,501,939
DIGITAL JOYSTICK CONTROLLER

Tom M. Hyltin, Dallas; Thomas G. Milner, Fort Worth, and Elam C. Frye, Jr., Dallas, all of Tex., assignors to Personal Peripherals Inc., Irving, Tex.

Filed Nov. 4, 1983, Ser. No. 548,658
Int. Cl.³ H01H 25/00
U.S. Cl. 200—6 A 15 Claims

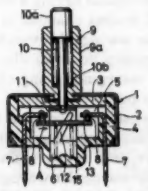


1. An electronic joystick controller comprising:
a hollow base portion having an upper and lower surface and encompassing a plurality of fixed electrical contact points;
a first elongate member pivotally mounted at a first end thereof through said upper surface of said hollow base portion; and
a planar conductive member disposed within said hollow base portion and suspended a selected distance above said plurality of fixed electrical contact points, said planar conductive member having a plurality of coplanar elongate contact portions for urging said first elongate member into an erect position and for contacting selected ones of said plurality of fixed electrical contact points in response to deflection of said coplanar elongate contact portions induced by manual displacement of said first elongate member from said erect position.

4,501,940
OPPOSED CONTACT SWITCH

Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 17, 1983, Ser. No. 542,818
Claims priority, application Japan, Oct. 18, 1982, 57-157718[U]
Int. Cl.³ H01H 15/00
U.S. Cl. 200—16 A 2 Claims

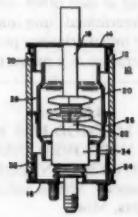


1. An opposed contact switch, comprising:
two stationary contacts,
a movable contact for contacting and electrically interconnecting said two stationary contacts,
first spring biasing means for biasing said movable contact into a first vertical position in contact with said two stationary contacts, said biasing means consisting of a contact spring directly in contact with said movable contact,
said movable contact having engaging knobs protruding therefrom,
a contact holder having vertically extending sides with guides therein inclined with respect to the vertical, said engaging knobs slidably fitting into said guides, and
plunger means for moving said contact holder vertically through a first portion of a stroke to cause said guides and engaging knobs to move said movable contact laterally across, but still in contact with said stationary contacts, and through a second portion of a stroke to cause said movable contact to move vertically away from the first position to a second vertical position out of contact with said stationary contacts, and
release of said plunger means results in the opposite sequence of movement of said movable contact.

4,501,941
VACUUM INTERRUPTER CONTACT MATERIAL

Sidney J. Cherry, Elmira, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1982, Ser. No. 436,867
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B 6 Claims

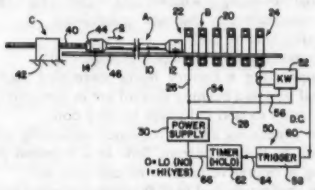


1. An improved vacuum interrupter electrical contact which exhibits an improved high voltage withstand characteristic and comprises a minor proportion of selected refractory metal, and a major proportion of dispersion strengthened copper.

4,501,942
METHOD AND APPARATUS FOR UNIFORM INDUCTION HEATING OF AN ELONGATED WORKPIECE

John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Sep. 9, 1982, Ser. No. 416,274
Int. Cl.³ H05B 6/40
U.S. Cl. 219—10.43 16 Claims



1. A method for inductively heating an elongated workpiece to a generally uniform temperature over the length thereof wherein said workpiece has a first portion with a uniform cross-section extending over a major part of the workpiece length and a second portion with a cross-section greater than said first portion, said method comprising the steps of:
(a) providing a multi-turn inductor having an entrance end

and an exit end with said inductor being generally coaxially disposed about an elongated workpath and selectively energizable by a controllable power supply to either one of two different preselected energization levels;

(b) moving at least one of said inductor and workpiece relative to the other at a constant rate along said workpath with consecutive sections of said workpiece and said inductor disposed in an inductively coupled relationship for heating said workpiece;

(c) energizing said inductor to a first one of said preselected energization levels during said step of moving said inductor and workpiece relative to one another, for inductively heating one of said workpiece first and second portions to generally a preselected temperature as it passes through said inductor;

(d) sensing the instantaneous electrical power absorbed by the workpiece from said inductor as the other one of said first and second workpiece portions is moved into an inductively coupled relationship therewith to create a first electrical signal proportional to the sensed instantaneous power absorbed from said energized inductor;

(e) creating a second signal in response to said first signal reaching a predetermined value; and,

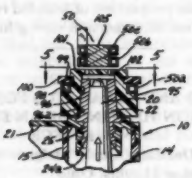
(f) shifting the energization level of said inductor to the other one of said preselected energization levels directly in response to said second signal, and maintaining said inductor energized at said other one of said energization levels for a predetermined time interval, for inductively heating said other one workpiece portion to generally said preselected temperature as it passes through said inductor.

4,501,943

APPARATUS AND METHOD FOR FUSING BATTERY TERMINALS WITH IMPROVED INDUCTION HEATING POWER CONTROL

David L. Lund, Minneapolis, Minn., assignor to GNB Batteries Inc., Mendota Heights, Minn.

Filed Sep. 19, 1983, Ser. No. 533,079
Int. Cl.³ H05B *6/06, 6/10*
U.S. Cl. 219—10.43 **12 Claims**



1. An apparatus for fusing the end of a lead battery cell terminal post to the end of a hollow lead bushing fixed in the cover of a battery being assembled and within which the terminal post is concentrically disposed comprising

an induction heating coil;

means supporting said induction heating coil;

means supporting a battery being assembled such that a terminal post and bushing thereof are in concentric operative relation to said induction heating coil;

means for generating a high-frequency oscillating current in said coil to induce current flow in a terminal post and bushing in operative relation to said coil; and

means for energizing said high-frequency current generating means to a predetermined first power level, maintaining said power level for a first predetermined period for melting the ends of said terminal post and bushing by induced current flow therein, and then continuously decreasing said power level to zero in a controlled manner for a second predetermined period of time to effect the fusion of the ends of the terminal post and bushing to a controlled depth said second predetermined period being shorter than said first predetermined period.

7. A method for fusing the end of a lead battery cell terminal post to the end of a hollow lead bushing fixed in the case of a battery being assembled and within which the terminal post is concentrically disposed comprising

supporting an induction heating coil;

supporting said battery being assembled such that a terminal post and bushing thereof are in concentric operative relation to said induction heating coil; and

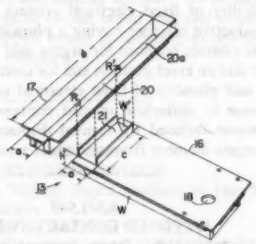
energizing said coil to a first predetermined power level for generating a high-frequency oscillating current in said coil to induce current flow in a terminal post and bushing in operative relation to said coil, maintaining said power level for a first predetermined period for melting the ends of said terminal post and bushing by said induced current flow, and then continuously decreasing said power level to zero in a controlled manner for a second predetermined period of time to effect the fusion of the ends of the terminal post and bushing to a controlled depth said second predetermined period being shorter than said first predetermined period.

4,501,944

TURNTABLE TYPE HIGH-FREQUENCY HEATING APPARATUS

Haruo Matsushima, Yamatokoriyama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1982, Ser. No. 451,781
Claims priority, application Japan, Dec. 25, 1981, 56-213466
Int. Cl.³ H05B *6/74*
U.S. Cl. 219—10.55 F **3 Claims**



1. A high-frequency heating apparatus comprising:

a heating chamber for accommodating an article to be heated;

a door provided at an opening at the front of said heating chamber;

a rectangular waveguide having a terminating opening coupled with said heating chamber at a bottom wall thereof, said rectangular waveguide extending vertically from said terminating opening downwardly;

said rectangular waveguide being excited in a $TE_{o,n}$ mode, where n is any positive integer;

a high-frequency oscillator coupled to said waveguide;

a turntable of a dielectric material disposed in said heating chamber above and in the vicinity of the terminating opening of said rectangular waveguide, so that an electric field substantially similar to said $TE_{o,n}$ mode in said rectangular waveguide and parallel to said turntable is produced on said turntable; and

means for rotating said turntable;

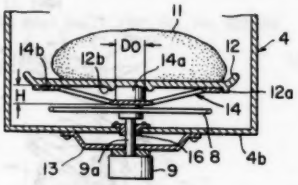
the rotating center of said turntable being disposed substantially on a bisector between a loop and a node adjacent to the loop of a standing wave produced in said rectangular waveguide.

4,501,945

MICROWAVE OVEN PROVIDED WITH TURNTABLE

Yoshinari Arabori, and Hisao Sato, both of Nagoya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 8, 1983, Ser. No. 502,336
Claims priority, application Japan, Jun. 9, 1982, 57-99010
Int. Cl.³ H05B 6/78
U.S. Cl. 219—10.55 F 14 Claims



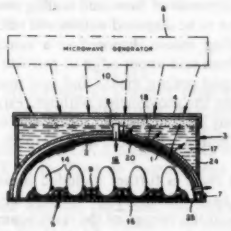
1. A microwave oven comprising:
a heating chamber defined by microwave reflecting walls;
means for generating microwave energy;
means for coupling the microwave energy into said heating chamber;
a rotary support member within said heating chamber and adapted to support on its top surface a turntable, said rotary support including a central portion, a peripheral edge disposed substantially horizontally in said chamber, and arms interconnecting said central portion and peripheral edge and defining openings with said central portion and peripheral edge for permitting reflected microwave energy to pass through said support member, said central portion having a microwave reflecting member protruding centrally from said top surface, said microwave reflecting member being axially symmetric with respect to the axis of rotation of said support member and terminating before penetrating a plane defined by an upper surface of said peripheral edge; and
means for rotating said rotary support member.

4,501,946

DEVICE FOR COOKING FOODS WITH MICROWAVES

Bodo B. Nibbe, Karlsplatz 6/IV, D-8000 Munich 2, and Paul Hirsch, Karl-Theodor-Str. 91, D-8000 Munich 40, both of Fed. Rep. of Germany

Division of Ser. No. 349,964, Feb. 18, 1982,. This application Jun. 11, 1984, Ser. No. 618,992
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106236
Int. Cl.³ H05B 6/80
U.S. Cl. 219—10.55 E 8 Claims



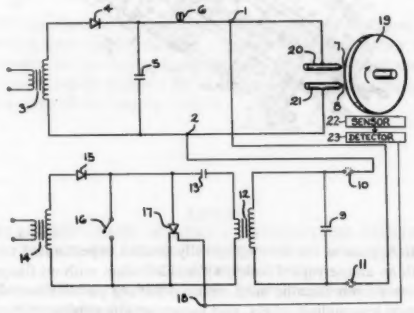
1. A device usable with a cooking stove equipped with a microwave source for rapidly boiling foods not suitable for cooking with direct microwave radiation, comprising:
a vessel positioned for irradiation by microwaves from said source, said vessel forming a vapor space above an area reserved for a quantity of water to be vaporized by said microwaves;
a receptacle underneath said vessel provided with conduit means communicating with said vapor space for admitting evolving steam to foods disposed in said receptacle; and
a radiation shield interposed between said receptacle and said vessel for protecting the contents of said receptacle from said microwaves.

4,501,947

ELECTRIC ARC UNBALANCE CORRECTION SYSTEM

Jack H. Kerlin, 1722 Sanford Place, Ann Arbor, Mich. 48103

Filed Dec. 15, 1983, Ser. No. 561,768
Int. Cl.³ B23K 37/00
U.S. Cl. 219—68 6 Claims



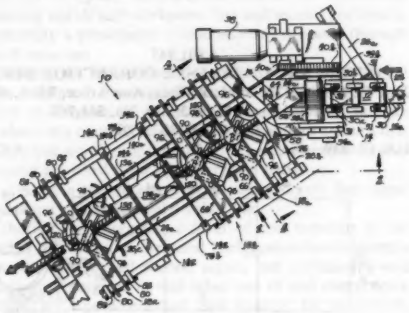
1. An electric arc unbalance correction system for correcting an unbalanced rotatable mass by electric arc removal of material from the mass, said system comprising electrode structure defining an air gap within which a portion of an unbalanced mass is disposed and via which an electric arc is delivered to remove material from the unbalanced mass while mass is being rotated, a capacitor bank power supply, coupling circuit means operatively coupling said capacitor bank power supply with said electrode structure for supplying electric current from the discharge of said capacitor bank via said electrode structure across the gap to remove material from the unbalanced mass, said capacitor bank power supply being incapable by itself of initiating electric arc discharge across the gap but being capable of sustaining and augmenting electric arc discharge across the gap once initiated, and an arc discharge initiation circuit operatively coupled with said coupling circuit means for producing a high-voltage, high-frequency pulse which is effective to initiate electric arc discharge across the gap so that said capacitor bank power supply can become effective to sustain and augment the discharge thereby removing material from the unbalanced mass, said coupling circuit means comprising a low resistance conductor between said capacitor bank and said electrode structure including several turns forming a low inductance choke coil but being free of other electrical circuit components, said choke coil being effective to prevent said capacitor bank power supply from impairing the effectiveness of said arc discharge initiation circuit yet allowing said capacitor bank power supply to sustain and augment the electric arc discharge without any substantial impediment of current flow, and means for causing said arc discharge initiation circuit to inject a high-voltage, high frequency pulse directly across the gap when a heavy spot of the unbalanced mass is disposed at the gap.

4,501,948

METHOD AND APPARATUS FOR FORMING SPIRAL TUBING

Jack S. Yampolsky, and Endre F. Peszeszer, both of San Diego, Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Aug. 16, 1982, Ser. No. 408,076
Int. Cl.[3] B23K 27/00
U.S. Cl. 219—121 LC 9 Claims



1. Apparatus for forming spirally wound unperforated tube with an uninterrupted leakproof welded seam without flanges thereon from metallic strip material having parallel laterally spaced longitudinal edges, said apparatus comprising, in combination,

frame means,

tube forming die means supported by said frame means and defining a substantially cylindrical bore therethrough having an entrance end and an exit end,

means for feeding a length of said metallic strip material into said entrance end of said die means in a direction such that the longitudinal axis of the strip subtends a predetermined acute angle with the axis of said bore, said feeding means being operative to advance said strip material through said cylindrical bore in a manner to form a spiral tube having said longitudinal edges in juxtaposed relation,

said tube forming die means being of the closed tube kind including a cylindrical wall therein defining the substantially cylindrical bore for forming the tube solely by contact with said cylindrical wall,

welding means supported by said frame means to receive said spiral tube from said die forming means and weld said juxtaposed edges so as to form an uninterrupted leakproof, continuous seam between said juxtaposed edges, and

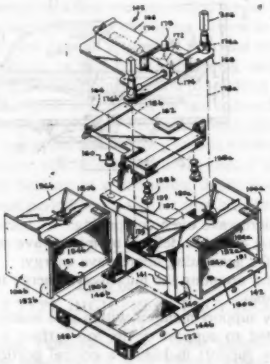
torquing means supported by said frame means and including a plurality of driven torque wheels adapted to apply a torque to said spiral tube in a manner to selectively control the relationship between said juxtaposed edges of said spirally wound tube during welding of said spiral tube, said torquing means comprising at least three torque wheels equally spaced about the circumference of said spiral tube and opposed to each other and having frictional contact with the spirally wound tube adjacent the closed tube forming die means to hold the longitudinal edges within the tube forming means and to reduce springback at the exit of the tube forming means and thereby reduce the force of the tube on the cylindrical wall forming the tube.

4,501,949

MOVABLE MACHINING CHAMBER WITH ROTATABLE WORK PIECE FIXTURE

Ronald F. Antol, North Huntingdon Township, Westmoreland County; Ralph W. Kalkbrenner, Irwin, and Donald L. Wolfe, Allison Park, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,263
Int. Cl.[3] B23K 27/00
U.S. Cl. 219—121 LC 14 Claims



1. Machining apparatus for establishing a machining environment about a work piece of a gas non-reactive with respect to the material of the work piece and for selectively moving the work piece with respect to a laser beam, and machining apparatus comprising:

(a) a machining chamber for receiving the work piece and for establishing the machining environment about the work piece, said machining chamber having an upper edge defining an opening for receiving the work piece, the remainder of said machining chamber defining a gas-tight envelope for preventing the interchange of the non-reactive gas within said machining chamber and a reactive gas outside of said machining chamber;

(b) means for generating and directing the laser beam into said machining chamber and onto the work piece;

(c) sealing means;

(d) means for moving selectively said machining chamber and the work piece with respect to the laser beam and said sealing means; and

(e) a slide table for movably supporting said moving means and said machining chamber between a first position, wherein said machining chamber is disposed beneath said sealing means and the laser beam is directed onto the work piece, and a second position, wherein said machining chamber is removed from said sealing means to permit the work piece to be disposed within said machining chamber;

(f) said sealing means disposed at a substantially uniform spacing from said upper edge to provide a peripheral gap between said sealing means and said machining chamber to facilitate the movements without restraint as imparted respectively by said moving means and said slide table, of said machining chamber with respect to said sealing means;

(g) wherein there is further included measuring means responsive to the laser beam to provide a manifestation indicative of the energy of the laser beam, said measuring means mounted upon said slide table and said slide table is movable to a third position, wherein the laser beam is aligned with said measuring means, whereby a manifestation indicative of the power level of the incident laser beam is provided; and

(h) wherein there is included first locator means disposed to

engage said slide table for accurately locking said slide table in each of its first and third positions.

4,501,950

ADAPTIVE WELDING SYSTEM

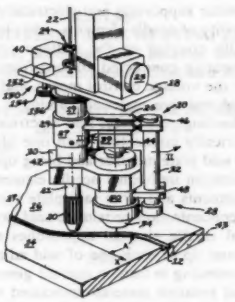
Richard W. Richardson, Columbus, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/01235, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982, PCT Pub. No. WO84/00913, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 7, 1982, Ser. No. 432,888

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—124.34 **33 Claims**



1. In a welding system (10) having a weld torch (20), a weld torch axis (42), a weld torch support assembly (21), means (28,38) for tracking and analyzing a weld path (12) of a workpiece (14,16) to which weld material (17) is to be applied, and means (101) for moving said weld torch support assembly (21) along said weld path (12) in response to signals generated by said tracking means (28,38), the improvement comprising:

said tracking and analyzing means (28, 38) including a workpiece scanning assembly (28) connected to said weld torch support assembly (21), said workpiece scanning assembly (28) including,

means (31) for projecting a beam of light (60) against said workpiece (14,16) and for moving said beam of light (60) in a closed path about an optical scanning axis (44) of fixed orientation parallel to and spaced apart from said weld torch axis (42);

means (33) for receiving and focusing reflections from said workpiece (14,16) of said beam of light (60),

means (19,40) for pivoting said scanning assembly (28) relative to said weld torch support assembly (21); and,

said tracking and analyzing means (28,38) further including means (38) for sensing and analyzing the focused reflections and controlling the position of said workpiece scanning assembly (28) in response to data obtained from the analysis of the focused reflections.

4,501,951

ELECTRIC HEATING ELEMENT FOR STERILELY CUTTING AND WELDING TOGETHER THERMOPLASTIC TUBES

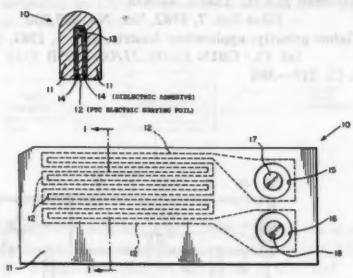
Joshua Benin, and Robert P. Luoma, II, both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1982, Ser. No. 408,417

Int. Cl.³ B29C *27/06*; H05B *3/10*; B26D *7/10*

U.S. Cl. 219—243 **22 Claims**

1. A heating element for sterilely welding first and second thermoplastic tubes together transversely of the axis of each tube consisting essentially of as an outer layer, a folded sheet of metal having a thermal conductivity of at least about 173 watts/m °K. at a 0.10 mm thickness and a tensile yield strength of at least about 34×10^4 kPa at a 0.10 mm thickness, a resistor disposed inside the fold of said folded sheet of metal; a layer of dielectric adhesive, stable to about 260° C., between inner surfaces of said folded sheet of metal and surfaces of said



resistor, thereby electrically insulating the resistor from the folded sheet and bonding the resulting structure together; said resistor having exposed terminals for reception of electrical current and the folded edge of said metal sheet being the melting edge of the heating element.

4,501,952

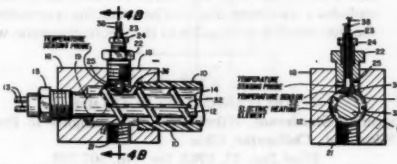
ELECTRIC FLUID HEATER TEMPERATURE CONTROL SYSTEM PROVIDING PRECISE CONTROL UNDER VARYING CONDITIONS

Kenneth E. Lehrke, Maple Grove, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Jun. 7, 1982, Ser. No. 386,017

Int. Cl.³ H05B *1/02*; F24H *1/10*; B05B *1/24*; F28F *1/36*

U.S. Cl. 219—305 **17 Claims**



1. An electrically operated fluid heater and control circuit comprising

(a) an elongated hollow tube adapted for insertion into a fluid flow line;

(b) an electrically operated heater in said hollow tube;

(c) a helical coil arranged about said heater in said hollow tube, said coil creating a helical fluid flow path in said hollow tube and around said heater;

(d) temperature sensing means for detecting the temperature of fluid in said tube, said sensing means comprising a conical housing having its apex contacting said heater and a conical surface area increasing in a direction away from said heater but in said fluid flow path, and a temperature responsive resistance element in said housing, and electrical conductors connected to said resistance element and projecting external said housing; and

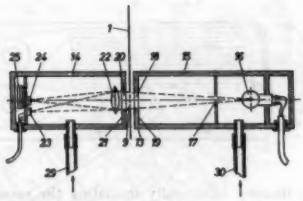
(e) temperature control circuit means connected to said electrical conductors and to said electrically operated heater, for controlling said electrically operated heater in response to the temperature of the fluid flowing through said flow path as sensed by said resistance element.

4,501,953

METHOD OF AND APPARATUS FOR CONTROLLING APPARATUS FOR PERFORATING STRIPS OF PAPER OR THE LIKE BY DISRUPTIVE SPARK DISCHARGES

Walter Hollinetz, Traun, Austria, assignor to Tann-Papier Gesellschaft m.b.H., Traun, Austria

Filed Jan. 7, 1982, Ser. No. 337,830
Claims priority, application Austria, Jan. 9, 1981, 50/81
Int. Cl.³ G01N *15/08, 21/00;* H05B *7/18*
U.S. Cl. 219—384 3 Claims



1. In an apparatus for perforating a perforate strip of material by disruptive spark discharge wherein the improvement comprises:

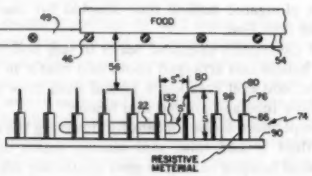
at least two chambers, means for guiding and moving the perforate strip between said chambers, a transmitter disposed in one of said chambers for transmitting electromagnetic waves, first and second receivers disposed in the other of said chambers and being adapted to receive electromagnetic waves transmitted by the transmitter and for generating respective signals, said chambers being provided with slots adjacent to the strip for passing said electromagnetic waves, and discharge control means for varying the intensity of spark discharges in dependence of the difference between said signals, wherein the chamber which contains the receivers includes a lens disposed near the slot that is permeable to the electromagnetic waves, and said lens serves to focus the waves at the receivers, and wherein the chamber which contains the transmitter includes a wave stop disposed between the transmitter and the slot which is permeable to the electromagnetic waves.

4,501,954

MECHANICAL ELECTRODE

Eugene J. Sturdevant, Wilmington, Del., assignor to Proctor-Silex, Inc., Chillicothe, Ohio

Filed Jun. 27, 1983, Ser. No. 507,739
Int. Cl.³ F24C *7/00*
U.S. Cl. 219—399 11 Claims



1. A mechanical electrode for use in an electrical circuit in a cooking appliance having a heating element means to cook food, the electrical circuit including a voltage power supply electrically connected to communicate voltage to the food, a surface of the food being in spaced relationship to the mechanical electrode for defining an electrical field for supporting electrical current, and a voltage control means interposed between the mechanical electrode and the voltage power supply for regulating the voltage supplied to the food for maintaining constant current flow in the field, the mechanical electrode operating at a different potential with respect to the food for establishing current contact with the food through the electrical field; the mechanical electrode comprising;

a plurality of electrically conductive needle elements, each of said needle elements having a pointed tip opposing the food surface, each said pointed tip being in current contact with an aligned portion of the food surface, said tip having a proximate voltage concentration determined by the voltage supply from the food through the electrical field and said voltage concentration normally being below an arcing potential for causing said pointed tip to generate corona current used to enhance heat and mass transfer at the food surface;

a plate member supporting and electrically interconnecting said plurality of needle elements, said plate member being electrically coupled to the voltage control means for communicating conducted current from said needle elements to the voltage control means; and

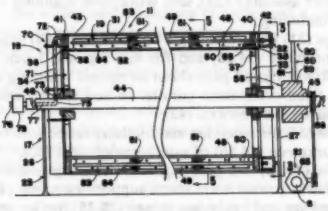
an electrical resistive material forming a discrete path of current-limiting resistivity, said electrical resistive material electrically connecting each one of said needle elements to said plate member and being operable to electrically isolate an individual needle element from adjacent needle elements and from said plate member when said voltage concentration proximate said pointed tip of said individual needle element approaches arcing potential, said pointed tip of each one of said adjacent needle elements continuing in corona current generating operation while said resistive material associated with one of said needle elements is absorbing voltage to suppress the formation of an arc.

4,501,955

ROTATABLE HEATING APPARATUS

Hal W. Bick, P.O. Box 20386, Billings, Mont. 59104

Filed Nov. 21, 1983, Ser. No. 553,521
Int. Cl.³ F28D *11/02*
U.S. Cl. 219—469 19 Claims



1. Rotatable heating apparatus including a support portion, a shell portion, a heating portion, a drive portion, a power supply portion and a control portion; said support portion including a frame section, said frame section including spaced upstanding sections, said upstanding sections including shaft support means; said shell portion including a substantially cylindrical outer section, a smaller substantially cylindrical inner section disposed within said outer section adjacent thereto and spaced therefrom, substantially parallel first and second end sections adjacent the ends of said cylindrical inner section, first and second annular sections enclosing the spacing between the ends of said inner and outer cylindrical sections, a shaft member disposed along the axis of said shell portion, ends of said shaft member extending outwardly beyond said end sections to said shaft support means; said heating portion including a plurality of spaced electrical heating elements disposed between said inner and outer cylindrical sections, said heating elements extending from said first annular section to a point adjacent said second annular section, insulating support

members disposed along the lengths of said heating elements spacing them from said cylindrical sections, said power supply portion including electrical collector means disposed on said shaft member adjacent to said first end section, electrical connector means extending from each of said heating elements adjacent said first annular section to said collector means; said drive portion including rotatable drive means disposed adjacent to said support portion, said drive means being operatively connected to said shaft member; said control portion including thermostat means for said heating elements and speed control means for said drive means; whereby a continuous substrate can be heated as it contacts said cylindrical outer section of said rotatable shell portion.

4,501,956

ELECTRICAL RESISTANCE HEATING ELEMENT

Hans A. Bergersen, Oslo, and Eilif Risberg, Osteras, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 18, 1981, Ser. No. 303,439
Int. Cl.³ H05B 3/10
U.S. Cl. 219—553 **12 Claims**

1. An electrical heating element comprising:

a sheet of an electrical resistance metal having a predetermined melting temperature; and

a strip of a metallic fuse material having a melting temperature below said predetermined melting temperature arranged in a predetermined pattern incorporated in said resistance metal sheet, said fuse material and said resistance metal strip constituting a conductive path of a uniform cross-section throughout.

4,501,957

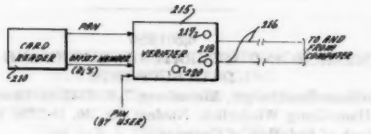
VERIFIER FOR A PERSONAL INDENTIFICATION SYSTEM

Marvin Perlman, Granada Hills, and Milton Goldfine, La-Crescenta, both of Calif., assignors to Trans-Cryption, Inc., La-Crescenta, Calif.

Continuation-in-part of Ser. No. 229,085, Jan. 28, 1981, Pat. No. 4,376,279. This application Dec. 1, 1982, Ser. No. 445,915
Int. Cl.³ H04L 9/00
U.S. Cl. 235—379 **11 Claims**

1. A verifier for use in a personal identification system of the type in which a card is issued to a person by an entity with a personal assigned number, definable as PAN, which is recorded on the card, and a number definable as an Offset Number, which is also recorded on the card, said Offset Number being generated by a generator of said system as a function of at least said PAN and a secret code in the form of a digital sequence secretly chosen, by and known only by said person, definable as PIN, the verifier comprising:

first means for receiving said PAN and said Offset Number, recorded on said card, for processing said PAN and thereafter mapping said PAN and the digits of the Offset Number, definable as D_i's, to provide a sequence of digits, definable as C_f's;



second means for receiving a PIN from a person the identity of which is to be verified and for processing said PIN to provide a sequence of digits, definable as C_i's; and

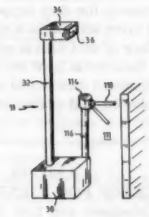
comparing means for comparing corresponding C_f's and C_i's to provide a valid signal when C_f's$=C_i$'s for each i and for providing an invalid signal when C_f's$\neq C_i$'s for one or more i's.

4,501,958

VERIFICATION SYSTEM, FOR EXAMPLE FOR PASSING THROUGH A TOLL POINT

Jean-Pierre Glize, Labastide D'Armagnac, and Michel M. Gaucher, Le Mesnil Saint-Denis, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Mar. 3, 1982, Ser. No. 354,506
Claims priority, application France, Mar. 5, 1981, 81 04446
Int. Cl.³ H04Q 1/30
U.S. Cl. 235—382 **7 Claims**



1. A portable object for use with an automatic verification system, comprising:

a casing;

an electronic circuit in said casing having at least one shift register memory for storing data including an indication of a number of units of value and quality data;

an emitter-receiver device in said casing capable of non-contacting coupling to a terminal of the verification system for emitting signals of bits in series corresponding to a read of the data in said shift register, and for receiving signals of bits in series to write data in said shift register;

means in said casing for storing check data received from said terminal through said emitter-receiver device;

a device for verifying the concordance between a portion of the received check data and first validity data stored in said object to deliver a read authorization;

means responsive to a read authorization for delivering the data stored in said shift register memory to said emitter-receiver device, for transmission to said terminal, while recirculating the same data through said shift register memory;

a device for verifying the concordance between said check data and second validity data stored in said object and

comprising a portion of the data in said shift register memory, to deliver a write authorization, and

means responsive to such write authorization for filling said shift register memory with new data received from said terminal,

whereby said terminal can change the second validity data upon each rewriting of new data in the portable object, and together with said units of value.

4,501,959

METHOD AND APPARATUS FOR ALIGNING FLAT DATA SUPPORTS

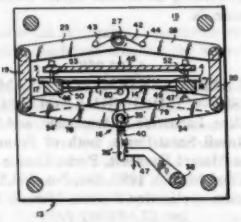
Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 247,167, Mar. 24, 1981,. This application Oct. 11, 1983, Ser. No. 540,821

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011318

Int. Cl.³ G06K *13/063, 13/067*

U.S. Cl. 235—485 **3 Claims**



1. A method of aligning a generally flat flexible data support, the steps of deforming the data support into a shape having a generally waved cross section in a plane substantially normal on one main surface of said data support, and thereafter exerting an alignment force on at least one edge of said data support by moving an alignment member in a direction being substantially perpendicular to said plane into engagement with said one edge.

4,501,960

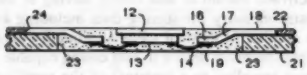
MICROPACKAGE FOR IDENTIFICATION CARD

Adrien Jouvet, Colomiers, and Eric Duvois, Toulouse, both of France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1981, Ser. No. 275,569

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—492 **17 Claims**



1. A micropackage identification card adapted to be carried and used by an individual and having machine-readable identifying information, comprising:

an integrated semiconductor device enclosed in encapsulating material and having electrical terminals extending from the encapsulating material; a first flexible sheet having an opening adapted to accommodate the integrated semiconductor device, the electrical terminals of the integrated semiconductor device being adapted to lie along a surface of the first flexible sheet; and a second flexible sheet having an opening larger than the opening in the first flexible sheet, the second flexible sheet being superimposed over the first flexible sheet in a manner to accommodate the electrical terminals in the opening of the second flexible sheet so that the electrical terminals are accessible for contact by a machine used to read the identifying information.

4,501,961

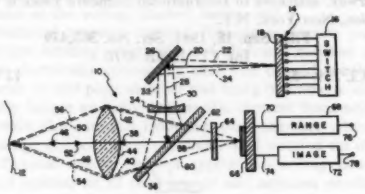
VISION ILLUMINATION SYSTEM FOR RANGE FINDER

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 1, 1982, Ser. No. 413,946

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **15 Claims**



9. Apparatus for use with character recognition and range finding equipment which comprises an array of radiation sensitive detectors positioned to receive radiation along a first path from a remote object and operable to produce a first output containing information relative to the character of the remote object and a second output containing information relative to the range to the remote object comprising:

radiation emitting means having first and second conditions, in the first condition said emitting means transmits radiation to the remote object so that the radiation from the remote object to the detector array may be used to produce the first output and, in the second condition, said emitting means transmits radiation so as to illuminate the remote object in a non-uniform pattern so that the radiation from the remote object to the detector array may be used to produce the second output; and

control means connected to said emitting means and operable to change said emitting means from the first condition to the second condition.

4,501,962

METHOD OF FOCUSING OPTICAL APPARATUS

Clarence F. Luck, Jr., Waltham, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 155,862, Jun. 2, 1980, Pat. No. 4,383,168. This application May 9, 1983, Ser. No. 492,858

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ G01J *1/20*

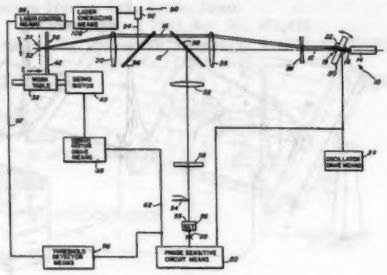
U.S. Cl. 250—201 **2 Claims**

1. A method of locating the focal plane of a lense and comprising the steps of:

producing a laterally translating beam of electromagnetic radiation

directing said beam successively along a plurality of paths intersecting at a focal spot in a focal plane:

detecting lateral translational movement of the directed beam in a transverse plane adjacent the focal plane; and



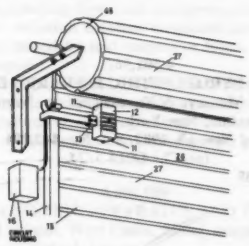
determining the position of said transverse plane relative to said focal plane.

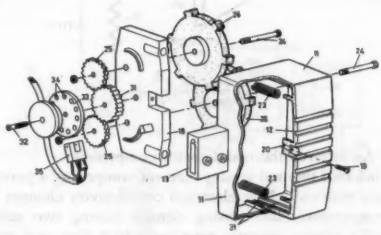
4,501,963

REVERSING DEVICE FOR ROLLER DOORS

Milan Perisic, Woodforde, Australia, assignor to Automatic Roller Doors, Australia, Pty., Ltd., Adelaide, Australia

Filed Nov. 3, 1982, Ser. No. 438,987
Claims priority, application Australia, Nov. 3, 1981, PF1401
Int. Cl.³ E05F *3/00*; G01D *5/38*
U.S. Cl. 250—231 SE **7 Claims**





1. A reversing device for use with a roller door of the kind having a sheet metal curtain carried on an overhead roller driven by a reversible motor, and guided for vertical movement by tracks engaging its edges, which said device, when installed on such a door, comprises:

rotational means in such engagement with a face of the curtain that descent of the curtain effects rotation thereof,

electrical impulse means operatively coupled to the rotational means,

a timer,

a timer output switch and motor switching circuit,

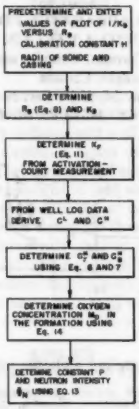
and electrical interconnection means between said impulse means, timer, output switch and motor switching circuit, so that said impulse means imparts a series of impulses to the timer upon said rotation of the rotational means, each impulse resetting the timer, but upon reduction of descent speed, said timer times out its entire timing period and actuates the timer and output switch, in turn actuating the motor switching circuit to reverse direction of rotation of the motor.

4,501,964

BOREHOLE COMPENSATED OXYGEN ACTIVATION NUCLEAR WELL LOGGING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,664
Int. Cl.³ G01V *5/10*
U.S. Cl. 250—270 **21 Claims**


PREDETERMINE AND ENTER VALUES OR PLOT OF I/I_0 VERSUS R_s
CALIBRATION CONSTANT H
RADII OF SONDE AND CASING
DETERMINE R_s (Eq. 8) AND K_s
DETERMINE K_f (Eq. 11) FROM ACTIVATION-COUNT MEASUREMENT
FROM WELL LOG DATA DERIVE C^L AND C^M
DETERMINE C_f^L AND C_f^M USING Eq. 6 AND 7
DETERMINE OXYGEN CONCENTRATION M_0 IN THE FORMATION USING Eq. 14
DETERMINE CONSTANT P AND NEUTRON INTENSITY ϕ_M USING EQ. 13

1. A method of nuclear well logging to determine oxygen concentration of a formation adjacent a well borehole while compensating for the effects of oxygen present in the well borehole, comprising the steps of:

(a) bombarding the formation and borehole constituents with high energy neutrons from a neutron source in a sonde;

(b) detecting with a gamma ray detector spaced from the source in the sonde gamma radiation resulting from the $O^{16}(n,p)N^{16}$ reaction from bombarded oxygen in the formation and borehole;

(c) obtaining a measure of detected gamma radiation in at least two gamma ray energy count windows;

(d) obtaining a borehole oxygen ratio of the gamma radiation in the gamma ray energy windows from bombarded oxygen in the borehole;

(e) obtaining a formation oxygen ratio of the gamma radiation in the gamma ray energy windows from the formation in the absence of bombarded borehole oxygen in the vicinity of the detector; and

(f) obtaining from the borehole oxygen ratio and the formation oxygen ratio a measure of the oxygen concentration in the formation.

10. A method of measuring neutron output intensity from a neutron source in a sonde which bombards formation and well borehole constituents with neutrons during well logging, comprising the steps of:

(a) bombarding the formation and borehole constituents with high energy neutrons from a neutron source in a sonde;

(b) detecting with a gamma ray detector spaced from the source in the sonde gamma radiation resulting from the

$O^{16}(n,p)N^{16}$ reaction from bombarded oxygen in the formation and borehole;

(c) obtaining a measure of detected gamma radiation in at least two gamma ray energy count windows;

(d) obtaining a borehole oxygen ratio of the gamma radiation in the gamma ray energy windows from bombarded oxygen in the borehole;

(e) obtaining a formation oxygen ratio of the gamma radiation in the gamma ray energy windows from the formation in the absence of bombarded borehole oxygen in the vicinity of the detector; and

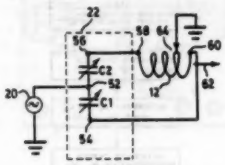
(f) obtaining from the borehole oxygen ratio and the formation oxygen ratio a measure of the neutron output intensity during said step of bombarding.

4,501,965

METHOD AND APPARATUS FOR SAMPLING A PLASMA INTO A VACUUM CHAMBER

Donald J. Douglas, Toronto, Canada, assignor to MDS Health Group Limited, Rexdale, Canada

Filed Jan. 14, 1983, Ser. No. 458,009
Int. Cl.³ H01J *49/04, 49/26*
U.S. Cl. 250—288 **23 Claims**



1. Apparatus for sampling a plasma into a vacuum chamber comprising:

(a) means for generating a plasma, including an electrical induction coil having first and second terminals and at least one turn between said first and second terminals, said turn defining a space within said coil for generation of said plasma,

(b) a vacuum chamber including an orifice plate defining a wall of said vacuum chamber,

(c) said orifice plate having an orifice therein located adjacent said space for sampling a portion of said plasma through said orifice into said vacuum chamber,

(d) and circuit means connected to said coil between said terminals to reduce the peak to peak voltage swing in said plasma.

4,501,966

INFRARED MICROSCOPE INSPECTION APPARATUS

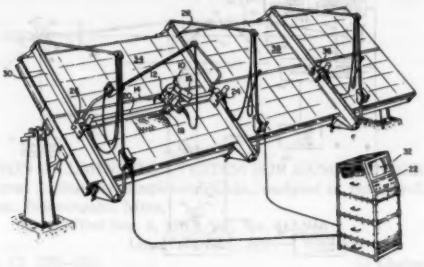
Steven E. Forman, Framingham, and James W. Caunt, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 13, 1981, Ser. No. 243,415
Int. Cl.³ H01J *31/50*
U.S. Cl. 250—332 **6 Claims**

1. Apparatus for illuminating an infrared transparent surface with infrared light and measuring light reflected through said surface which comprises:

a. means for irradiating said surface with infrared radiation from at least three sources, each of said sources being positioned at an angle between about 15° and 60° from the orthogonal direction to said surface,

b. a lens positioned above said surface having its axis orthogonal to said surface and adapted to receive infrared radiation reflected from said surface,



c. means for converting infrared radiation transmitted through said lens to visible light, and

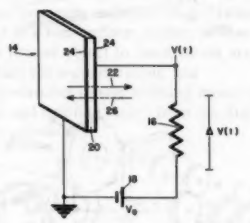
d. means for sensing said visible light.

4,501,967

BROAD BAND PYROELECTRIC INFRARED DETECTOR

Avner Shaulov, Monsey, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,804
Int. Cl.³ G01J *5/24*
U.S. Cl. 250—338 **17 Claims**



12. An infrared thermal detector comprising:

an infrared thermal sensing element comprising a pyroelectric material whose electrical conductivity changes with temperature, said sensing element having two substantially planar opposite sides on which first and second electrodes are provided, respectively;

a load resistor having first and second electrodes, the first electrode of the load resistor being electrically connected to the first electrode of the sensing element; and

voltage supply means for providing a voltage across the second electrodes of the sensing element and the load resistor;

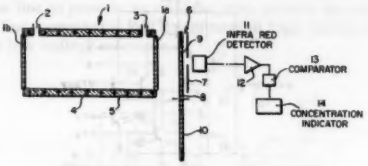
characterized in that:

at the average equilibrium temperature of operation of the sensing element the ratio, k, of the thermal time constant of the sensing element to the PTB time constant of the detector is greater than zero.

4,501,968
INFRARED RADIATION GAS ANALYZER

Hiroyuki Ebi, and Kimio Miyatake, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Mar. 2, 1983, Ser. No. 471,455
Claims priority, application Japan, Mar. 9, 1982, 57-33703[U]
Int. Cl.³ G01J 1/00
U.S. Cl. 250—343 4 Claims



1. An infrared radiation gas analyzer for determining the concentration of an ingredient in a sample gas, comprising:

a sample gas containing means for containing a sample gas at a temperature at which the ingredient the concentration of which is to be determined will emit infrared radiation in a range characteristic of the ingredient and means for allowing said infrared radiation to escape from said containing means;

a pair of filters, one of said filters transmitting only radiation in said range and the other of said filters transmitting only radiation in a range near to said firstmentioned range;

means for alternately passing said filters across the path of radiation escaping from said containing means;

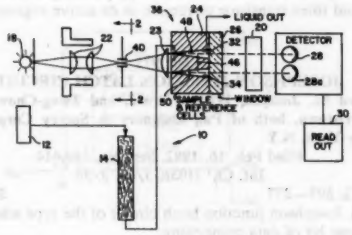
an infrared radiation detector positioned for receiving the radiation passed by said respective filters and emitting a pulsed signal;

means for determining the difference between or the ratio of the respective pulses of said signal as an indication of the concentration of the ingredient the concentration of which is to be determined in the sample gas.

4,501,969
PHOTOMETRIC APPARATUS AND PROCESS

Anthony C. Lymneos, West Upton, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Mar. 8, 1982, Ser. No. 356,064
Int. Cl.³ G01J 5/08
U.S. Cl. 250—373 22 Claims

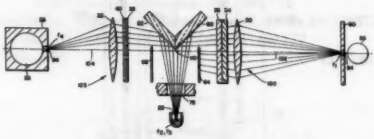


1. In a photometer of the type utilizing a light source, a sample cell adapted to transmit a continuously-flowing liquid to be analyzed from an inlet port near one end thereof through a flowpath to an outlet port near the other end thereof, a means for measuring the absorption of light in said sample cell, a light detector forming means to receive substantially all nonabsorbed light transmitted from said sample cell, means for eliminating liquid lens effects, said means comprising a generally conical sample cell, a smaller end of said sample cell being nearer said light source, such that there is substantially reduced loss of light refracted by said lenses on walls of said sample cell, wherein improvement comprises an elliptical aperture interposed between said light source and said sample cell to render a light beam entering said sample cell substantially circular.

4,501,970
FLUOROMETER

Keith E. Nelson, Virdes, Calif., assignor to Dynatech Laboratories Incorporated, Alexandria, Va.

Filed Oct. 12, 1982, Ser. No. 433,825
Int. Cl.³ G01N 21/64
U.S. Cl. 250—458.1 8 Claims



1. A fluorometer for measuring the fluorescence of a material in an open top microtest well comprising support means for supporting the structure defining said well, a source of exciting light, first means for passing a beam of said exciting light downwardly through the open top of said well to strike and fluorescently excite the material in said well when said well is positioned at a preselected location on said support means, a photo-detector, and second means for directing the light which is emitted by the fluorescently excited material and which passes upwardly through the open top of the well to said photodetector for detection thereby, said first means including a lens for focusing said beam on a spot within said well.

4,501,971
RADIOGRAPHIC INTENSIFYING SCREEN

Takeji Ochiai, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1982, Ser. No. 442,957
Claims priority, application Japan, Nov. 20, 1981, 56-187502
Int. Cl.³ H01J 1/64
U.S. Cl. 250—483.1 3 Claims

1. A radiographic intensifying screen comprising a substrate and a fluorescent layer provided on said substrate and consisting essentially of a binder and a radioluminescent phosphor dispersed therein, said binder comprising linear polyester resin and nitrocellulose.

4,501,972
FLOAT DETECTION SYSTEM

Charles E. Foerster, Jr., Northville; Robert E. Miller, Ann Arbor, both of Mich., and Aldren M. Pace, Reseda, Calif., assignors to Scans Associates, Inc., Livonia, Mich.

Filed Mar. 1, 1982, Ser. No. 353,166
Int. Cl.³ G01N 15/06
U.S. Cl. 250—577 18 Claims

1. A float detection system for detecting the position of a float in a glass tube flow meter undergoing calibration, said float detection system including:

(a) a means for tracking said float operatively mounted adjacent to said glass flow tube;

(b) a ball screw operatively connected to said means for tracking said float to move it in an axial direction;

(c) a stepper motor connected to said ball screw to operate the same;

(d) a pulse encoder attached to the other end of said ball screw;

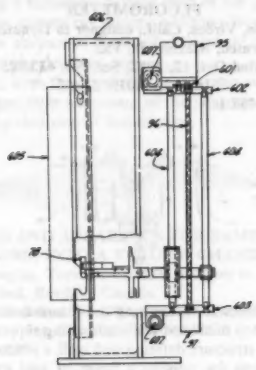
(e) a pulse encoder circuit to produce pulses related to the rotation of said ball screw;

(f) a float detector display circuit connected to said pulse

encoder to indicate the position of said means to track said float;

(g) a float detector position display connected to said float detector display circuit to display the position of said float detector;

(h) an optical conditioner circuit connected to said means to track said float to supply power thereto;



(i) a stepper driver circuit adapted to supply appropriate signals to said stepper motor;

(j) a float detector control circuit adapted to receive signals from said optical conditioner circuit and to utilize them to supply signals to said stepper driver circuit; and

(k) a travel limit circuit connected to said float detector control circuit.

4,501,973

SKIDS FOR ROTATING MACHINERY

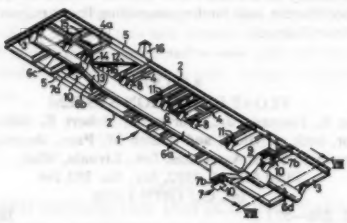
Keith E. Fenemore, Sleaford; George P. Foden, Newark, and Christopher J. Baker, Lincoln, all of England, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 13, 1982, Ser. No. 377,728

Claims priority, application United Kingdom, May 14, 1981, 8114831

Int. Cl.³ F16N *1/04*

U.S. Cl. 290—1 A **15 Claims**



1. A skid for mounting and supporting rotating machinery comprising only three spaced supporting members each incorporating a universal joint, an elongate torsion resisting member rigidly connected to said supporting members and a machinery support platform connected to said torsion resisting member in torque transmitting relationship thereto; wherein

said torsion resisting member has first and second portions which have separate, parallel axes; and

one of said first and second portions is connected to but one of said supporting members, and the other of said portions is connected to the other two of said three supporting members.

4,501,974

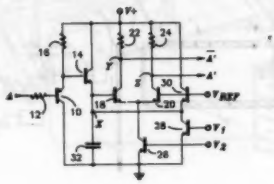
PULSE STRETCHING AND LEVEL SHIFTING CIRCUIT

Ira Miller, Tempe; Michael W. Null, and Robert N. Dotson, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 13, 1982, Ser. No. 449,035

Int. Cl.³ H03K *17/56, 3/017*

U.S. Cl. 307—246 **4 Claims**



1. A pulse stretching circuit, comprising:

a capacitor having first and second terminals;

first transistor means coupled to said first terminal for supplying a charging current to said capacitor and charging said capacitor to a first voltage when an input signal pulse is in a first logical state;

differential transistor means having a first input coupled to said first terminal and a second input coupled to a reference voltage which is smaller than said first voltage, said differential transistor means for generating a first output when the voltage at said first terminal is less than said reference voltage and for generating a second output when the voltage at said first terminal is greater than said reference voltage; and

second transistor means coupled to said first terminal for discharging said capacitor when said input signal pulse is in a second logical state causing the voltage at said first terminal to fall below said reference voltage;

said first transistor means comprising a first transistor having an emitter coupled to a first source of supply voltage, a collector coupled to a second source of supply voltage and a base coupled to receive said input signal pulse; and a second transistor having a collector coupled to said first source of supply voltage, a base coupled to the emitter of said first transistor, and an emitter coupled to said first terminal and to said first input; and

said second transistor means comprising a third transistor having a collector coupled to said first terminal, an emitter coupled to said second source of supply voltage, and base coupled to a third source of supply voltage which causes said third transistor to remain in its active region.

4,501,975

JOSEPHSON JUNCTION LATCH CIRCUIT

Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,414

Int. Cl.³ H03K *3/00, 3/38*

U.S. Cl. 307—277 **5 Claims**

1. A Josephson junction latch circuit of the type adapted to store one bit of data comprising,

an AND gate comprising at least four Josephson junctions,

said AND gate having at least one data input and one enable input,

said data input and said enable input having two logic states,

a biasing current source connected to said AND gate,

said biasing current source having two logic clock states,

a Josephson flip-flop comprising a flux storage loop,

said flip-flop having a data input coupled to the output of said AND gate,

said flip-flop having a reset input coupled to a reset input line,

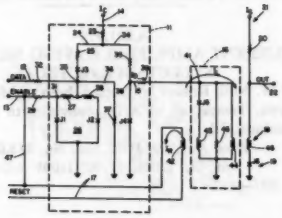
said flip-flop having a true quantity output,

said flip-flop comprising a sense line coupled to said true quantity output and having at least one Josephson junction and a source impedance in said sense line adapted to sense the state of flux in said flux storage loop,

said flux storage loop being set in a high flux state by the presence of a high logic level data input, a high logic level enable input and a high logic level biasing current source clock,

a Josephson OR logic circuit connected to the output of said sense line to provide an amplified true quantity output,

a sink line connected to said Josephone OR logic circuits and to a low voltage reference,



a second stage Josephson junction amplifier having an input branch and an output branch, said input branch being connected to said sink line, said output branch providing an inverted true quantity output,

whereby, a high logic input to said OR logic circuit switches said OR logic circuit ON and reduces the current in said sink line causing said second stage amplifier to be switched OFF, and

whereby, a low level logic input to said OR logic circuit switches said OR logic circuit OFF and increases the current in said sink line causing said second stage amplifier to be switched ON.

4,501,976

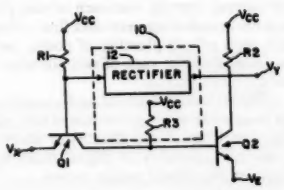
TRANSISTOR-TRANSISTOR LOGIC CIRCUIT WITH HYSTERESIS

Jeffery A. West, Pleasant Grove, and Thomas D. Fletcher, Provo, both of Utah, assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Sep. 6, 1982, Ser. No. 415,109

Int. Cl.³ H03K *19/003, 19/088, 19/20*

U.S. Cl. 307—456 **12 Claims**



1. An electronic circuit which has: a first current source; a first bipolar transistor having an emitter for receiving an input signal, a base coupled to the first current source, and a collector; a second current source; and a like-polarity second bipolar transistor having an emitter at a control voltage, a base coupled to the collector of the first transistor, and a collector coupled to the second current source, wherein the second transistor turns on as the input signal moves in a first voltage rise/fall direction to a first threshold voltage; characterized by hysteresis means coupled to the base of the second transistor and coupled between its collector and the first current source for causing the second transistor to turn off as the input signal moves in a second voltage rise/fall direction opposite to the first rise/fall direction to a second threshold voltage where the absolute value of the difference between the first threshold voltage and the control voltage as the second transistor turns on exceeds the absolute value of the difference between the second threshold voltage and the control voltage as the second transistor turns off.

4,501,977

AND-OR LOGIC CIRCUIT INCLUDING A FEEDBACK PATH

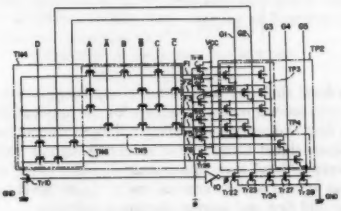
Hideharu Koike, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 3, 1982, Ser. No. 446,772

Claims priority, application Japan, Dec. 7, 1981, 56-196571

Int. Cl.³ H03K *19/017, 19/096, 19/177*

U.S. Cl. 307—469 **11 Claims**



1. An AND-OR logic circuit having two power supply terminals and an output signal line, comprising:

a first AND circuit having a plurality of series circuits which comprise transistors of a first conductivity type coupled in series along their current conduction paths and which respectively receive input signals at their respective control electrodes;

a first OR circuit having transistors of a second conductivity type which have their current conduction paths selectively connected in parallel to each other between one of said power supply terminals and said output signal line and selectively receive AND signals from said series circuits at their respective control electrodes;

a second AND circuit having a plurality of series circuits which comprise transistors of the first conductivity type connected in series along their current conduction paths and which selectively receive at least two output signals from said first OR circuit at their respective control electrodes;

a second OR circuit having transistors of the second conductivity type which have their current conduction paths selectively connected in parallel to each other between one of said power supply terminals and said output signal line and selectively receive AND signals from said series circuits of said second AND circuit at their respective control electrodes;

a precharge circuit connected between one end of each of said series circuits of said first and second AND circuits and one of said power supply terminals;

a first pull-down circuit connected between the other end of each of said series circuits of said first and second AND circuits and the other of said power supply terminals;

a second pull-down circuit coupled between one end of said output signal line and other of said power supply terminals; and

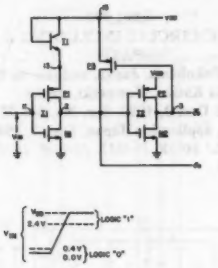
a control means for controlling said precharge circuit and said first pull-down circuit with a first synchronizing signal and said second pull-down circuit with a second synchronizing signal of the substantially opposite phase to said first synchronizing signal.

4,501,978

LEVEL SHIFT INTERFACE CIRCUIT

Carmine J. Gentile, Hightstown; Melvin L. Hagge, Bridgewater, both of N.J., and Robert C. Croes, Nijmegen, Netherlands, assignors to RCA Corporation, New York, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,459
Int. Cl.³ H03K *19/017, 19/094, 19/092*
U.S. Cl. 307—475 **13 Claims**



8. A level shift interface circuit comprising:

first and second power terminals for the application thereto of first and second operating voltages, respectively;

an input signal terminal for receiving signals varying between a "low" level approximately equal to the voltage at said second power terminal and a "high" level intermediate said first and second operating voltages;

first and second output terminals for driving loads;

first, second, third, fourth and fifth insulated-gate field-effect transistors (IGFETs), each IGFET having source and drain electrodes defining the ends of a conduction path, and a control electrode; said first, third and fifth IGFETs being of one conductivity type and said second and fourth IGFETs being of complementary conductivity type;

means connecting the control electrodes of said first and second IGFETs to said signal input terminal;

means connecting said source electrode of said second IGFET to said second power terminal;

a relatively constant voltage dropping means, having a relatively constant voltage offset, connected between said source electrode of said first IGFET and said first power terminal for producing a reduced voltage at said source electrode of said first IGFET;

means connecting the drain electrodes of said first and second IGFETs to said first output terminal for producing thereat either a voltage approximately equal to said reduced voltage when said first IGFET is first turned-on in response to a "low" level input signal, or a voltage approximately equal to said second operating voltage when said second IGFET is turned-on in response to a "high" level input signal;

means interconnecting said third and fourth IGFETs to form a complementary inverter, including means connecting the source of said third IGFET to said first power terminal, the source of said fourth IGFET to said second power terminal, the control electrodes of said third and fourth IGFETs to said first output terminal and their drains to said second output terminal for producing at said second output terminal either a first signal which makes a transition from said first and said second operating voltage in response to said "low" level input or a second signal which goes from said second to said first operating voltage in reponse to said "high" level input; and

means connecting the source-to-drain path of said fifth IGFET between said first power terminal and one of said first output terminal and said source of said first IGFET, and means connecting its control electrode to said second output terminal for, in response to said low level signal at said input terminal, turning-on said fifth IGFET and, concurrently,

(a) quickly raising the level at said first output terminal towards the potential at said first power terminal,

(b) establishing the full value of said first operating voltage at said first output terminal,

(c) positively driving any load connected to said first output terminal to the voltage at said first power terminal,

(d) turning-off said third IGFET regardless of the value of its threshold voltage relative to the value of the offset of said voltage dropping means, and

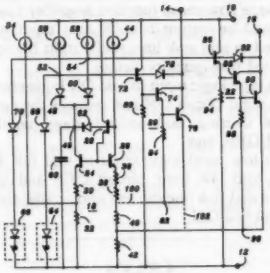
(e) producing complementary signals at said first and second output terminals which can swing fully between said first and second operating voltages.

4,501,979

CURRENT AMPLIFIER HAVING MULTIPLE SELECTABLE OUTPUTS

Michael W. Null; Robert N. Dotson, both of Mesa, and Robert B. Davis, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1982, Ser. No. 413,054
Int. Cl.³ H03K *17/62;* **H03F** *3/04*
U.S. Cl. 307—494 **5 Claims**



1. A current amplifier having a first and a second voltage terminal, comprising:

plurality of output means coupled between said first and said second voltage terminals;

current means couped between said first and said second voltage terminals and coupled to said plurality of output means for providing a predetermined current to said output terminal, said current means comprising:

a first transistor coupled to a plurality of nodes; and

a plurality of current sources, one each of said plurality of current sources coupled between said first voltage terminal and one each of said plurality of nodes, one each of said nodes coupled to one each of said plurality of output means; and

plurality of selection means, each of said plurality of selection means coupled to a respective one of said plurality of output means, each one of said plurality of selection means receiving one of a plurality of digital input signals for selecting at least one of said output means.

4,501,980

HIGH TORQUE ROBOT MOTOR

Ross D. Welburn, Santa Rosa, Calif., assignor to Motornetics Corporation, Santa Rosa, Calif.

Filed Jun. 4, 1982, Ser. No. 385,034
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—12 **9 Claims**

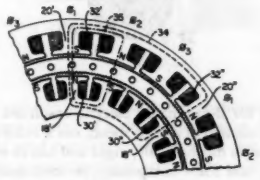
1. An improved electric motor of the type having first and second stators having stator poles and a rotor mounted between them, the rotor and the stators each having opposing teeth, and electric coils wrapped about the stator poles for

generating a magnetic flux therein and in the rotor which flux brings some segment of the rotor teeth into alignment with the opposed teeth of the magnetically energized stator poles, wherein the improvement comprises:

opposed stator pole pieces on the first and second stators, with the stator teeth projecting from the pole pieces,

the rotor teeth project from the surface of the rotor in opposition to the stator pole piece teeth and have the same angular pitch as the opposing stator teeth, and

a plurality of coils, a single one of each of said coils encircling a separate one of the stator pole pieces, the coils of opposed pole pieces being connected together as a pair and a plurality of such pairs being connected together to form a single one of a plurality of phases, the coils of each phase being wound on stator pole pieces which as a group



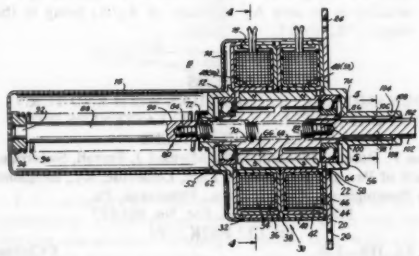
have pole piece teeth which are all simultaneously alignable with the opposing rotor teeth, the coils being connected and wound such that when a particular phase is energized, a magnetic flux is generated in each stator pole piece of such phase which flux has a magnetic polarity opposite to the magnetic polarity of the flux generated in the opposed pole piece and in the nearest stator pole piece of the same phase and also opposite to the magnetic polarity of the flux generated in the immediately adjacent pole piece during the preceding energized phase, whereby the rotor teeth align with the stator pole piece teeth of the energized phase and the magnetic flux generated travels only in stators between adjacent stator poles of the energized phase, only travels in the rotor transversely, and only travels through the rotor between opposed poles of the energized phase.

4,501,981

RETURN-TO-ZERO STEPPER MOTOR

Charles W. Hansen, Wolcott, Conn., assignor to Haydon Switch & Instrument, Inc., Waterbury, Conn.

Filed Oct. 15, 1981, Ser. No. 311,754
Int. Cl.³ H02K 37/00
U.S. Cl. 310—49 R **25 Claims**



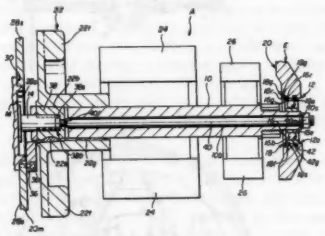
1. A stepper motor comprising a stator assembly having first and second toroidal stator electromagnets each having a plurality 2n of evenly spaced axial teeth forming alternating salient stator poles, the stator poles of the first and second stator electromagnets being offset from one another by an electrical angle of 90°; a permanent-magnet rotor having a rotor magnet with a plurality n of pairs of poles thereon arranged to face said stator poles, a rotor core supporting said rotor magnet and having a threaded central axial aperture, and bearing means mounting said rotor core for rotation relative to said stator electromagnets; an axially movable shaft assembly including a threaded screw disposed in said axial aperture and adapted to mate therewith, and engaging means engaging a longitudinal track on said shaft assembly for preventing relative rotation of said screw and said rotor assembly while permitting axial movement of said screw, at least to a limited extent; and means urging said screw to a zero axial position thereof whenever no current is applied to said stator electromagnet wherein the central axial aperture of the core and the threaded screw have a thread pitch selected to be low enough to permit rotation of said rotor to advance said shaft assembly when stepping current is applied to said stator electromagnets, but steep enough to permit force of said urging means to return said shaft assembly to said zero axial position when no current is applied to said electromagnets.

4,501,982

ELECTRIC GENERATOR WITH REPLACEABLE MOTOR

Robert R. McMinn, Crosby, Tex., assignor to Harrison Equipment Co., Inc., Houston, Tex.

Filed Mar. 3, 1983, Ser. No. 471,700
Int. Cl.³ H02K 5/16
U.S. Cl. 310—90 **5 Claims**



1. An electrical generator with a rapidly replaceable motor of the type which comprises a housing with an end bell portion, a generator shaft rotable within the housing, an armature connected to a shaft within the interior of the housing, an opening formed in the end bell of the housing opposite a motor with a rotating motor shaft for rotating the generator shaft, a bearing assembly frictionally mounted within the opening rotably supporting one end of the generator shaft opposite the motor, the invention comprising:

a shoulder formed in the interior of the housing concentric to the opening, said shoulder comprising a first side parallel to the longitudinal axis of the generator shaft and a second side perpendicular to said first side, said second side extending between said first side and the opening;

outer and inner removable retaining rings; an annular outer groove formed in said first side of said annular shoulder for mounting said removable outer retaining ring to restrict the bearing assembly against undesired longitudinal movement inward of the housing;

an inner groove formed in the outer surface of the bearing assembly adjacent the opening for mounting said removable inner retaining ring to restrict the bearing assembly against undesired longitudinal movement outward of the housing and locking the bearing assembly in the opening;

a through-stud extending through a central axis bore of the generating shaft; and

a tap slug adaptor connected to one end of said through-stud; said adapter having an axial bore for receiving a portion of the motor shaft to demountably secure the motor shaft in an essentially aligned relationship with the generator shaft; said bore of said tap slug adaptor having means for coupling said adapter and the motor shaft to

transmit the rotation of the motor shaft to the generator shaft.

4,501,983

ELECTRIC MACHINE

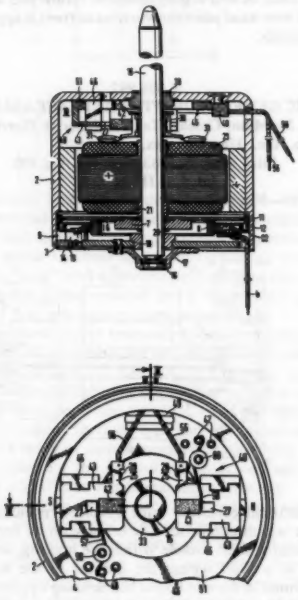
Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 928,885, Jul. 28, 1978, abandoned. This application Mar. 31, 1981, Ser. No. 249,339

Claims priority, application Fed. Rep. of Germany, Jan. 1, 1978, 2803956

Int. Cl.³ H02K *47/04*

U.S. Cl. 310—113 **21 Claims**



1. An electric drive motor for signal processing equipment comprising a stator and a rotor together forming a cylindrical radial air gap, a stationary motor housing of generally cylindrical configuration, said motor housing being made of soft magnetic material and serving as part of the magnetic circuit of the motor, brush means located between one axial end of said motor housing and said rotor; a separate flux guide member of generally cylindrical configuration mounted in the interior of the motor housing between the other axial end thereof and said rotor coaxial with the rotation axis of the latter, and having a diameter slightly smaller than the diameter of the motor housing and being of a magnetically soft material; rpm-signal generating means located in the flux guide member part to be shielded at least from electromagnetic interference originating exteriorly of the motor housing; the rpm-signal generating means including a relatively thin ferromagnetic rotor disk connected to the rotor coaxially with the axis of rotation thereof and having a plurality of teeth on its circumference, a stationary ring surrounding said rotor disk and being formed with a number of permanent magnetic pole pairs of opposite pole polarity and corresponding to the number of teeth on the rotor disk, and a stationary inductive coil arranged coaxially with the axis of rotation of said rotor in proximity to the path of movement of the teeth of the rotor disk to generate rpm signals.

4,501,984

COLUMNAR SOLID BODY ROTOR

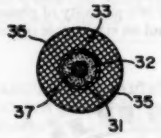
Matsuo Mishima, Tokyo, Japan, assignor to Micro Technology Laboratory Co., Ltd., Japan

Continuation of Ser. No. 259,430, May 1, 1981, abandoned, which is a continuation of Ser. No. 929,963, Aug. 1, 1978, abandoned. This application Dec. 15, 1983, Ser. No. 561,649

Claims priority, application Japan, Aug. 3, 1977, 52-93557; Nov. 17, 1977, 52-138216

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—261 **6 Claims**



1. A rotor for d-c dynamo electric machines wherein said rotor is to be rotated at a high speed, has a relatively low loss, low inertia and is mechanically rigid and has an extremely low permeability; said rotor comprising, in combination:

a rotor shaft rotatable around the axis thereof and made of a non-magnetic material;

a cylindrical dust core of small volume compared to the volume of said rotor and symmetrically disposed around said shaft, said cylindrical dust core comprising a hollow cylinder having an outer diameter and having an interior diameter, said interior diameter being fixed to said rotor shaft, the length of said cylindrical dust core being greater than its said outer diameter; said dust core consisting of finely powdered ferromagnetic particles which are bound within and are interspersed within a solid insulation medium, whereby said dust core can have a high flux density while having a small eddy current loss;

insulation sleeve means fixed to and surrounding and electrically insulating said outer diameter of said dust core;

a winding fixed to the outer surface of said insulation sleeve means and closely wound around said dust core and having an outer diameter which encloses a given cross-sectional area which is perpendicular to said rotor shaft;

the volume conversion permeability of said rotor as a whole, including said dust core, said rotor shaft, said winding and said insulation sleeve being at least several times higher than the permeability of free space;

said outer diameter of said dust core enclosing an area A_1 which is perpendicular to the axis of said rotor shaft and wherein said given cross-sectional area enclosed by said winding is an area A_2; the ratio of A_2/A_1 being in the range of 0.3 to 0.7.

4,501,985

DYNAMOELECTRIC MACHINE WITH END TURN SUPPORT ASSEMBLY HAVING FASTENERS WITH LOCKING DEVICES

Diane P. Dobson, Pleasant Hills; Michael J. Farrell, Swissvale, both of Pa., and Raymond S. Lutz, Louisville, Ky., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1984, Ser. No. 605,957

Int. Cl.³ H02K *3/46*

U.S. Cl. 310—270 **5 Claims**

1. A dynamoelectric machine comprising:

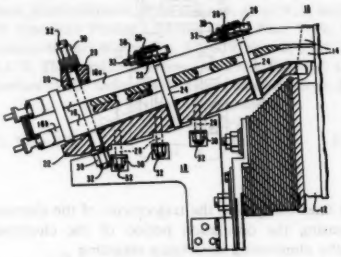
windings that have end turns extending from ends of a core and an end turn support assembly for said end turns;

said end turn support assembly comprising means for uniting said end turns and comprising one or more fasteners that each join some other elements of said end turn support assembly;

each of said fasteners comprising a stud having scew threads,

a nut engaged on said stud screw threads, an outer portion of said stud extending beyond said nut, and a locking device on said outer portion of said stud for securing said nut against loosening in service;

said locking device comprising one or more layers of cord



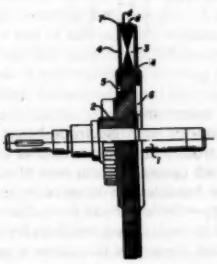
wrapped and tied on said stud outer portion screw threads and a cured coating of resinous material on said layers of cord, said stud outer portion having a flat surface area providing a noncylindrical stud cross section to which said wrapped cord conforms and preventing rotation of said cord.

4,501,986

FERROMAGNETIC CORE DISK ARMATURE WITH BAR WINDINGS

Olaru Gheorghe, Bucharest, Romania, assignor to Institutul de Cercetari Pentru Industria Electro-Tehnica-Icpe, Bucharest, Romania

Filed Aug. 21, 1979, Ser. No. 68,496
Int. Cl.³ H02K 1/22
U.S. Cl. 310—268 **10 Claims**



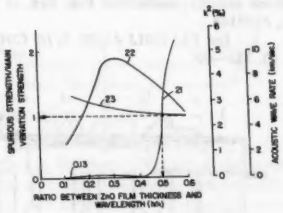
1. An armature for axial air gap electric motors or the like, comprising: a disk-shaped ferromagnetic core; and means forming one armature winding in a single layer with one collector, said means comprising a plurality of first winding sections disposed on one side of the core and each having a radially inwardly extending prolongation forming the one collector, a plurality of second winding sections disposed on the other side of the core and each identical to the first winding sections without the prolongation and means interconnecting the first and second winding sections only at the periphery of the core.

4,501,987

SURFACE ACOUSTIC WAVE TRANSDUCER USING A SPLIT-FINGER ELECTRODE ON A MULTI-LAYERED SUBSTRATE

Tsuneo Mitsuyu, Hirakata; Shusuke Ono, Takatsuki; Ritsuo Inaba, Hirakata, and Kiyotaka Wasa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 327,039
Claims priority, application Japan, Dec. 8, 1980, 55-172845
Int. Cl.³ H03H 9/25
U.S. Cl. 310—313 A **1 Claim**



1. A surface acoustic wave transducer comprising:

a multi-layered substrate having a non-piezoelectric substrate composed of one of either sapphire or α-alumina or silicon and having a zinc oxide piezoelectric film deposited directly thereon, the surface acoustic wave of said piezoelectric film having a smaller phase velocity than that of said non-piezoelectric substrate; and

an interdigital electrode formed on a surface of said piezoelectric film, said interdigital electrode having split-type fingers;

wherein said non-piezoelectric substrate comprises a (0112) face sapphire crystal, and said piezoelectric film comprises a (1120) face zinc oxide single crystal film, said zinc oxide single crystal film having a thickness h in the range of $0.1 < h/\lambda \leqq 0.5$ (where λ is a wavelength of said surface acoustic wave);

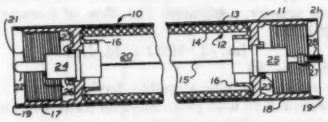
whereby said thickness of said piezoelectric film is in a range in which the strength of fundamental response is smaller than that of a harmonic response.

4,501,988

ETHYLENE QUENCHED MULTI-CATHODE GEIGER-MUELLER TUBE WITH SLEEVE-AND-SCREEN CATHODE

Nicholas M. Mitrofanov, Cleveland, and Victor G. Berner, Mayfield Heights, both of Ohio, assignors to Harshaw/Filtrol Partnership, Cleveland, Ohio

Filed Apr. 1, 1982, Ser. No. 364,466
Int. Cl.³ H01J 47/08
U.S. Cl. 313—93 **4 Claims**



1. In a Geiger-Mueller radiation detector including an outer tubular stainless steel cathode, an anode disposed in spaced apart relationship thereto in a sealed chamber walled by said cathode, and a gaseous mixture of noble gas containing a minor amount of a quench gas sealed in said chamber, the improvement comprising a sleeve-and-screen cathode in contact with said gaseous mixture, the sleeve comprising a tungsten layer in electrical contact with said outer tubular cathode, and the

screen being in electrical contact with said sleeve and comprising a 6 to 140 size mesh (U.S. Standard Screen) metal selected from the group consisting of brass and nickel, said screen coated with bismuth in an amount in the range from about 15 mg/cm^2 to about 30 mg/cm^2 of screen surface area.

4,501,989

RADIATION DETECTING ARRANGEMENT FOR COUNTING AN IONIZING RADIATION

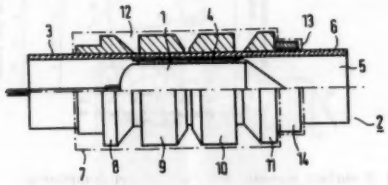
Dieter von der Brake, Altena, Fed. Rep. of Germany, assignor to International Standard Electric Coporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,628

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149148

Int. Cl.³ H01J *47/08, 5/16*; G01T *1/18*

U.S. Cl. 313—93 **8 Claims**



1. A radiation detecting arrangement for measuring an ionizing radiation comprising:

a radiation detector having a tubular shape; and

a compensating filter arrangement including

a slightly absorbing supporting tube surrounding said detector, and

ring-shaped filter parts fastened to and surrounding an outer surface of said tube,

said tube being made from a metal having a low medium ordinal number of the periodic system of elements and having an adhesive layer on said outer surface thereof, and

said filter parts are individual parts of at least one selected one of a heavy metal sleeve and a heavy-metal alloy sleeve, said related one of said sleeves being fastened by said layer to said tube and said filter parts being formed from said selected one of said sleeves by removal of excessive sleeve material therefrom after said selected one of said sleeves is fastened to said tube by said layer.

4,501,990

ELECTRON TUBE, ESPECIALLY TRANSMITTING TUBE, WITH A DEVICE FOR ELIMINATING INTERFERING RETARDING-FIELD EFFECTS

Jochen Stahl, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 282,720, Jul. 13, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 563,001

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027756

Int. Cl.³ H01J *1/46, 21/10*

U.S. Cl. 313—299 **6 Claims**

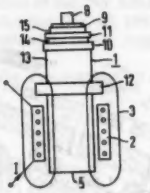
1. In an electron tube assembly, having:

an electron tube with given electron trajectories and a given electron oscillation period;

coaxial anode and cathode electrodes and grids each defined substantially by coaxial cylindrical surfaces; the improvement which comprises:

means disposed around said tube for generating a magnetic field for operating said tube at higher modulation and with residual plate voltages near zero to eliminate interfering retarding field effect oscillations;

said magnetic field having field lines running inside said tube substantially parallel to the cylindrical surfaces of the electrodes and grids, said field lines substantially perpendicularly intersecting the trajectories of the electrons moving radially from the cathode electrode to the anode electrode during operation of said electron tube, and said



field lines elongating the trajectories of the electrons for increasing the oscillation period of the electrons and thereby eliminating interfering retarding

field effect oscillations at anode voltages that are close to zero potential.

4,501,991

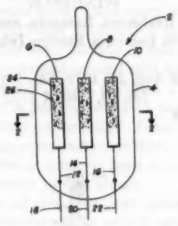
LOW BREAKDOWN VOLTAGE, HIGH CURRENT GLOW LAMP

John Fajt, Wynnewood, Okla., assignor to Xenell Corporation, Wynnewood, Okla.

Filed Apr. 12, 1982, Ser. No. 367,557

Int. Cl.³ H01J *1/14, 1/30, 17/48, 61/64*

U.S. Cl. 313—589 **10 Claims**



1. A glow lamp, comprising:

at least two electrodes, each electrode being spaced from each other electrode and having a member constructed of a substance which causes adjacent ones of said electrodes to require a first breakdown voltage to be applied thereto before a first appreciable current flows therebetween;

a material applied to each of said members for causing adjacent ones of said electrodes to require a second breakdown voltage within the range between approximately 80 volts (rms) and approximately 100 volts (rms) to be applied thereto before a second appreciable current flows therebetween, said second breakdown voltage being less than said first breakdown voltage;

a compound applied to each of said members for permitting a third appreciable current of at least approximately 10 amperes (rms) to flow between respective ones of said electrodes when said second breakdown voltage is applied, said third appreciable current being greater than said second appreciable current; and

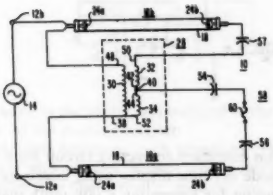
a housing having said electrodes disposed therein.

4,501,992

ENERGY CONSERVING INSTANT-START SERIES-SEQUENCE FLUORESCENT LAMP SYSTEM AND FLUORESCENT LAMP WITH OVERCURRENT PROTECTION

George S. Evans, Caldwell; Edward W. Morton, Teaneck; John F. Gilmore, deceased, late of Verona, and by Roderick A. Gilmore, Administrator, West Orange, all of N.J., assignors to North American Philips Lighting Corp., New York, N.Y.

Continuation-in-part of Ser. No. 300,319, Sep. 8, 1981, Pat. No. 4,435,670. This application Aug. 23, 1982, Ser. No. 410,763
The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.
Int. Cl.[3] H05B *37/00*
U.S. Cl. 315—122 12 Claims



1. In combination with an instant-start series-sequence fluorscent lamp system including a pair of input terminal means for connecting said system to a power source, a pair of fluorescent lamp means each comprising an elongated tubular vitreous envelope enclosing a discharge-sustaining filling and carrying phosphor means on the inner surface thereof, substantially hollow vitreous re-entrant stem presses sealed to each end portion of said envelope and having lead-in means sealed therethrough and operatively supporting electrodes within said envelope proximate each end portion thereof, transformer means including a primary winding, a secondary winding and an auxiliary winding, a first of said lamp means having one of said electrodes in circuit between one of said input terminal means and one end of said primary winding, the other of said electrodes of said first lamp means in circuit with a point common to one end of said secondary winding and one end of said auxiliary winding, the second of said lamp means having one of said electrodes in circuit between the other of said input terminals and the other end of said primary winding, the other of said electrodes of said second lamp means in circuit with the other end of said secondary winding, the other end of said auxiliary winding in circuit with said one end of said primary winding, and ballast capacitor means in circuit between said common point and said other electrode of said first lamp means, the improvement which comprises:

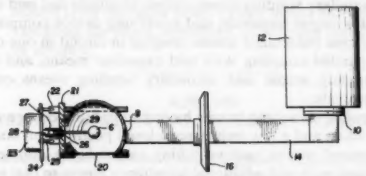
a first power-reducing capacitor means of predetermined capacitance in series circuit with said first lamp means and a second power-reducing capacitor means of predetermined capacitance in series circuit with said second lamp means, and protective device means in circuit with said first power-reducing capacitor means and responsive to a predetermined increase in the system operating current through said first power-reducing capacitor means to effectively remove from circuit said first power-reducing capacitor means, whereby said lamp system is protected from overload conditions encountered upon failure of said second lamp means.

4,501,993

DEEP UV LAMP BULB

Peter Mueller, Gaithersburg; Michael G. Ury, Bethesda, and Charles H. Wood, Rockville, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Oct. 6, 1982, Ser. No. 433,070
Int. Cl.[3] H05B *41/16, 41/24*
U.S. Cl. 315—248 2 Claims



2. A microwave generated electrodeless lamp for producing relatively high output in the deep UV part of the spectrum (210–240 nm) having an electrodeless lamp bulb wherein loss of bulb transparency with exposure to said deep UV radiation over time is substantially reduced, resulting in substantially increased bulb lifetime and the requirement that the bulb can be changed only relatively infrequently, resulting in minimal lamp down time, comprising,

means for generating microwave energy,

an electrodeless lamp bulb comprised of an envelope which is filled with a plasma forming medium, which when excited emits radiation in the deep UV part of the spectrum (210–240 nm), and

means for coupling said generated microwave energy to said bulb to excite said plasma and cause said deep UV radiation to be generated, and wherein,

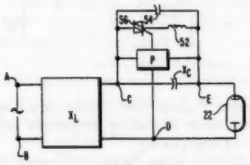
said lamp envelope is made of substantially water-free synthetic quartz.

4,501,994

BALLAST MODIFYING DEVICE AND LEAD-TYPE BALLAST FOR PROGRAMMING AND CONTROLLING THE OPERATING PERFORMANCE OF AN HID SODIUM LAMP

Robert J. Spreadbury, Murrysville, Pa., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 414,114, Sep. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 282,993, Jul. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 264,324, May 18, 1981, abandoned. This application Aug. 10, 1983, Ser. No. 522,544
Int. Cl.[3] H05B *37/02*
U.S. Cl. 315—307 24 Claims



1. In combination with a lead-type ballast apparatus for operating a high-intensity-discharge lamp, a device for modifying said ballast apparatus in order to program and control the operating performance of the high-intensity-discharge lamp as operated by said modified ballast apparatus;

said lead-type ballast apparatus having apparatus input terminals adapted to be coupled to a source of AC energizing

potential and apparatus output terminals across which said lamp to be operated is adapted to be coupled; and

said lead-type ballast apparatus comprising an inductive reactance portion and a capacitive reactance portion, said inductive reactance portion comprising a current-limiting high-reactance transformer means having primary winding means coupled to said apparatus input terminals and secondary winding means coupled to the secondary winding means output terminals, said capacitive reactance portion comprising capacitor means coupled between said secondary winding means output terminals and said apparatus output terminals; said modifying device comprising:

additional inductance means coupled in circuit in one of (1) a parallel coupling with said capacitor means, and (2) a coupling across said secondary winding means output terminals,

controlled switching means having a high impedance open position and a low impedance closed position and control terminal means, said switching means being coupled in circuit with said additional inductance means so that when said switching means is open, said modified ballast apparatus delivers a first level of current to an operating lamp, and when said switching means is closed, said modified ballast apparatus delivers a second and different level of current to an operating lamp; and

sensing and programming means operable to sense at least one predetermined lamp operating parameter and to generate an output control signal which is indicative of a predetermined parameter desired for said operating lamp, and said sensing and programming means having an output connected to the control terminal means of said switching means to control the relative proportion of time said switching means is open and closed in order to control in programmed fashion the predetermined lamp operating parameter desired for said operating lamp.

4,501,995

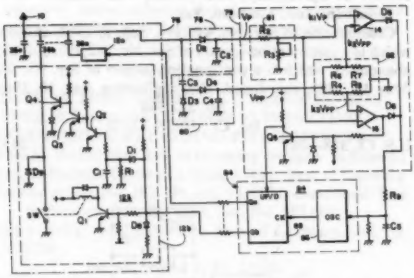
AUTOMATIC "S" CORRECTION CIRCUIT

Harold W. Olmstead, Hillsboro; Gary D. Andrews, Portland, both of Oreg., and Clayton C. Walquist, West Valley City, Utah, assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 6, 1982, Ser. No. 366,011

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **5 Claims**



1. An automatic 'S' correction circuit for use with a resonant scan deflection circuit including deflection coil means, said correction circuit comprising:

S-shaping capacitor means having a terminal for connection to the deflection coil means, said capacitor means being of selectively variable effective capacitance;

detector means connected to said S-shaping capacitor means for detecting the peak voltage and the peak-to-peak voltage across the capacitor means; and

control means connected to the detector means and the S-shaping capacitor means and responsive to the detected values of said peak voltage and said peak-to-peak voltage to vary the effective capacitance of the capacitor means to maintain said peak voltage and said peak-to-peak voltage in a predetermined relationship.

4,501,996

DEFLECTION DISTORTION CORRECTING CIRCUIT

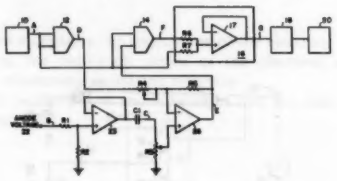
Hidefumi Yamaguchi, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 474,406, Mar. 11, 1983,. This application Apr. 18, 1984, Ser. No. 601,112

Claims priority, application Japan, Mar. 19, 1982, 57-43065

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **1 Claim**



1. A deflection distortion correcting circuit for a deflecting circuit for cathode ray tube display using interlaced scanning and having a circuit for generating a saw tooth wave for deflecting an electron beam in the direction perpendicular to raster scanning lines and an output linear amplifier circuit for driving the deflecting coil, the improvement comprising:

first multiplying means for generating a squared output in response to said saw tooth wave,

second multiplying means for receiving said saw tooth wave at one input thereof,

first adding means having an output connected to said output linear amplifier circuit and for adding the output of said second multiplying means to said saw tooth wave,

means responsive to the anode voltage of said cathode ray tube to generate a signal indicating the change of the anode voltage,

second adding means for generating the difference between the output of said first multiplying means and said signal indicating the change of the anode voltage, and

means for connecting the output of said second adding means for the other input of said second multiplying means.

4,501,997

MAGNETIZATION FOR BRUSHLESS DIRECT CURRENT OUTER ROTOR MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,744

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1982, 3201280

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 **8 Claims**

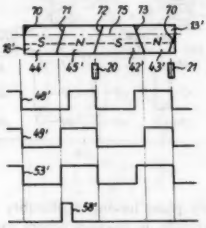
2. A brushless direct current outer rotor motor particularly for driving magnetic storage discs, said motor having a substantially cylindrical air gap and comprising:

an outer rotor;

a permanent magnetic exciting magnet having at least two pairs of poles;

a permanent magnetic control magnet having the same number of poles as said exciting magnet, both said magnets being supported on the interior of said rotor, each pole being separated from its circumferentially adjacent pole by an interface, a first of the pole pair of said control magnet being asymmetrical in that the pole of one magne-

tizing direction of said first pair is circumferentially shorter than the other pole of said first pair and the other pole pairs being symmetrical, the pole interfaces of said exciting and control magnets being substantially linear, the interfaces with respect to the rotor axis being obliquely angled, the slope of all pole interfaces except a first pole interface being substantially identical to one another and the slope of said first pole interface diverging with respect to the other pole interfaces, the reciprocal spacings between said pole interfaces being substantially



the same in the center, as measured in the rotor axis direction, of the exciting magnet;

two position detectors, each providing output signals and facing said control magnet and positioned stationarily substantially diametrically opposite one another on a line extending through the rotor axis, said detectors being sensitive to said control magnet; and

an evaluation circuit responsive to the output signals of said position detectors, said evaluation circuit producing only one pulse per rotor rotation.

4,501,998

NUMERICAL CONTROLLER EQUIPPED WITH OPTIONAL BLOCK SKIP FUNCTION

Ryoichiro Nozawa, Shibuya; Tsuyoshi Nagamine, Hachioji; Hideaki Kawamura, Hachioji, and Mitsuto Miyata, Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

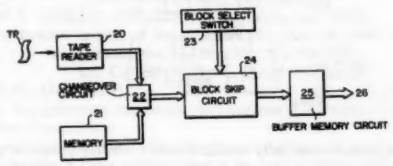
PCT No. PCT/JP81/00279, § 371 Date Jun. 11, 1982, § 102(e) Date Jun. 11, 1982, PCT Pub. No. WO82/01425, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 13, 1981, Ser. No. 395,077

Claims priority, application Japan, Oct. 13, 1980, 55-142569

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—568 **5 Claims**



1. A numerical controller having an optional block skip function, comprising:

numerical information storage medium means for storing a cutting program having inserted in a predetermined section thereof a plurality of machining blocks, each block including at its head or intermediate portion skip object indicating information for specifying that the block is the object of optional block skip control and skip select information which is data for deciding whether to skip the block and which can assume at least two values;

block select switch means for entering skip indicating information indicating which ones of the blocks stored as the objects of the optional block skip control in the numerical information storage medium means are to be skipped during actual machining; and

block skip circuit means for determining whether the skip object indicating information is present at the head or intermediate portion of each block read out from the numerical information storage medium means, and, if not present, for executing the block and if present, comparing the skip select information with the skip indicating information from the block select switch means and skipping or executing the block depending on whether the block is to be skipped.

4,501,999

SYSTEM FOR STOPPING SPINDLE AT COMMANDED POSITION

Yoshinori Kohzai, Hino; Yoshiki Fujioka, Higashiyamato, and Naoto Ota, Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

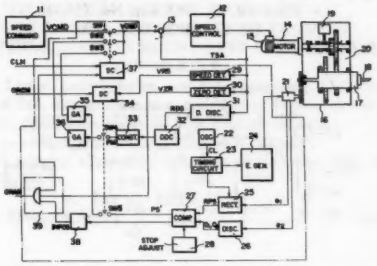
PCT No. PCT/JP81/00341, § 371 Date Jul. 27, 1982, § 102(e) Date Jul. 27, 1982, PCT Pub. No. WO82/01841, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 18, 1981, Ser. No. 403,641

Claims priority, application Japan, Dec. 4, 1980, 55-171157

Int. Cl.³ G05D *23/275*

U.S. Cl. 318—632 **6 Claims**



1. A system for stopping a spindle at a commanded position operating at a commanded speed, comprising:

an electric motor;

a speed detector, operatively connected to said electric motor, for detecting a speed of rotation of said electric motor and for producing an actual speed signal;

a speed control circuit, operatively connected to said speed detector and to receive the commanded speed, for effecting control to nullify the offset of the actual speed from the commanded speed;

a spindle operatively connected to and driven by said electric motor; and

a position control circuit, operatively connected to said spindle and said speed control circuit, for generating a position offset signal corresponding to an offset of a position of a predetermined portion of said spindle from the commanded position at which said portion of said spindle is to be stopped, the rotation of said spindle being controlled by said speed control circuit to maintain said commanded speed and by said position commanded to nullify said position offset signal, said position control circuit comprising:

a resolver, operatively connected to said spindle, having a secondary coil and having two primary coils producing output voltages;

a resolver exciting signal generator, operatively connected to said resolver, for supplying an exciting signal to the secondary coil of said resolver;

a synchronous rectifier circuit, operatively connected to

one of the primary coils of said resolver, for providing synchronous rectification of the output voltage from said one of said primary coils;

a quadrant discrimination circuit, operatively connected to the other of said primary coils, for converting the output voltage from said other of said primary coils into rectangular waves;

a waveform combining circuit, operatively connected to said synchronous rectifier circuit and said quandrant discrimination circuit, for combining the output voltage of said synchronous rectifier circuit and the output voltage from said quadrant discrimination circuit to produce said position offset signal which smoothly crosses a zero level at the commanded position at which said spindle is to be stopped; and

a stopping position adjusting circuit, operatively connected to said waveform combining circuit, for adjusting a position of a lattice point at which said position offset signal crosses the zero level.

4,502,000

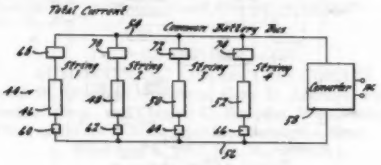
DEVICE FOR BALANCING PARALLEL STRINGS

Matthew S. Mashikian, Storrs, Conn., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jul. 19, 1983, Ser. No. 515,348

Int. Cl.³ H02J *3/32, 7/00*

U.S. Cl. 320—6 **17 Claims**



1. In a battery plant having a plurality of battery strings connected electrically in parallel where each of said battery strings is formed by a plurality of batteries connected electrically in series, the improvement comprising:

magnetic circuit means in association with each of said battery strings for balancing the electrical current flow through said battery strings.

9. A battery plant system, comprising:

power conditioning means for converting alternating current electrical power to direct current electrical power during the charging of said battery plant and converting direct current electrical power to alternating current electrical power during the discharging of said battery plant;

a plurality of battery strings connected electrically in parallel across common bus conductors to said power conditioning means;

a plurality of battery modules connected electrically in series to form each of said battery strings;

bypass switching means, in association with each of said battery modules, for redirecting electrical current flow around a failed battery module in response to a failure condition; and

magnetic circuit means in association with each of said battery strings for balancing the electrical current flow through said battery strings in response to at least one failed battery module by equalizing the voltages across said common bus conductors for each of said battery strings.

4,502,001

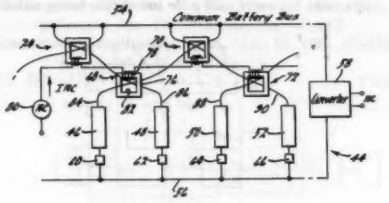
CURRENT BALANCING FOR BATTERY STRINGS

James H. Galloway, New Baltimore, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jul. 19, 1983, Ser. No. 515,351

Int. Cl.³ H02J *3/32, 7/00*

U.S. Cl. 320—6 **20 Claims**



1. In a battery plant having a plurality of battery strings connected electrically in parallel where each of said battery strings is formed by a plurality of batteries connected electrically in series, the improvement comprising:

magnetic circuit means for balancing the electrical current flow through said battery strings, said magnetic circuit means being associated with said battery strings such that conductors carrying the electrical current flow through each of said battery strings pass through said magnetic circuit means in directions which cause the electromagnetic fields of at least one predetermined pair of said conductors to oppose each other.

4,502,002

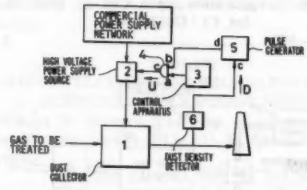
ELECTROSTATICALLY OPERATED DUST COLLECTOR

Takashi Ando, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 413,984

Int. Cl.³ B03C *3/68*

U.S. Cl. 323—237 **3 Claims**



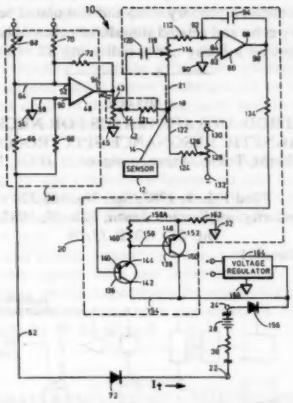
1. An electrostatically operated dust collector comprising a high voltage power supply circuit on which is taxed a direct current of high voltage fed from a commercial power supply and a control circuit for controlling said high voltage power supply circuit, the dust collector further including a dust-density measuring device, a pulse generator capable of transmitting a pulse as a gate signal for a width of time T_1 for a period of time, T_1+T_2, so that when the dust density detected by said dust-density meansuring device is decreased, $T_1/(T_1+T_2)$ can be reduced and when it is increased, said $T_1/(T_1+T_2)$ can be increased, and a gate circuit for transmitting an input from said control circuit to said high voltage power supply circuit while said pulse for said width of time is being transmitted as said gate signal.

4,502,003

TWO WIRE CIRCUIT HAVING AN ADJUSTABLE SPAN

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jul. 29, 1983, Ser. No. 518,377
Int. Cl.³ G05F *1/58*; G08C *19/02*
U.S. Cl. 323—275 **9 Claims**



1. A two wire circuit having a total direct current signal, I_t, at least a portion of which is representative of a sensor signal and which is responsive to a parameter to be sensed, wherein I_t flows through a first terminal coupled to an external power source and load and then through a second terminal, and wherein the circuit comprises:

current control means coupled to the first and second terminals and to the sensor for controlling the portion of I_t representative of the sensor signal;

feedback means coupled to the current control means for providing a feedback signal which is a function of I_t;

feedback amplifier means coupled to the current control means for amplifying the feedback signal to provide an amplified feedback signal; and

span means coupled to the feedback amplifier means and to the current control means for solely adjusting the amplified feedback signal such that I_t is controlled by the current control means at least as a function of the sensor signal and the adjusted, amplified feedback signal.

4,502,004

CURRENT PULSE MONITOR

John A. Schindler, P.O. Box 703, Metairie, La. 70004

Continuation-in-part of Ser. No. 164,231, Jun. 30, 1980. This application Dec. 2, 1982, Ser. No. 430,588
Int. Cl.³ G01R *19/16, 19/26, 1/22*
U.S. Cl. 324—103 P **7 Claims**

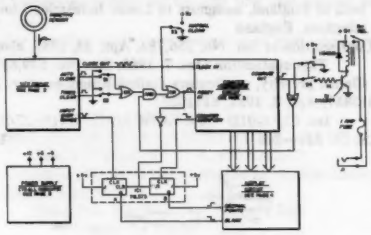
1. An apparatus for monitoring current pulse within a conductor comprising:

a. a sensor member, inductively coupled to said conductor, having a first, positive and a second negative electrical lead;

b. means, electrically connected to said first and second leads, responsive to the passage of a single, non-sinusoidial current signal coupled to said sensor member for determining the instantaneous peak value of said pulse signal, further comprising;

c. a unipolar voltage-to-frequency converter means, electrically connected to said leads, adapted for converting a positive voltage pulse induced by said single electrical current signal coupled to said sensor member into a series of electrical pulses, the frequency of said pulses being proportional to the induced voltage;

e. resetting means, electrically connected to said leads, adapted for converting a negative voltage pulse induced by said single electrical current signal coupled to said sensor member into a single reset pulse; and



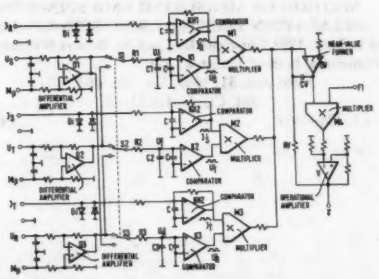
f. digital counter means connected to said converter means and said resetting means, adapted for counting the total number of the electrical pulses generated by said converter means, between successive reset pulses.

4,502,005

METHOD AND APPARATUS FOR DETERMINING THE ANGLE BETWEEN THE AIR-GAP FLUX VECTOR AND THE STATOR CURRENT VECTOR OF AN ASYNCHRONOUS MACHINE FED FROM AN INTERMEDIATE CURRENT-LINK FREQUENCY CONVERTER

Herbert Lisner, Ludwigshafen, and Peter Michalak, Weinheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,128
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112326
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—158 MG **17 Claims**



1. Method for determining the angle between the air-gap flux vector and the stator current vector of a three-phase asynchronous machine being fed from a frequency converter with an intermediate current-link, at which stator voltages and stator currents are measured, which comprises transforming current blocks of the stator currents into square waves of constant amplitude and extending the current blocks of the stator currents to 180° el., filtering out fundamental components from the stator voltages, shifting the phase of the fundamental components lagging 90° el., converting the phase-shifted fundamental components into square waves of constant amplitude, multiplying at least one square wave of the currents by the square wave of the voltage phase following the current phase, and forming the mean value thereof.

4,502,006

DISPLACEMENT MEASURING TRANSDUCERS AND THEIR USE FOR SENSING VEHICLE SUSPENSION DISPLACEMENTS

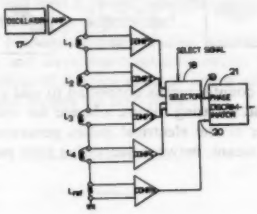
Alan Goodwin, Birmingham, and Malcolm Brearley, Solihull, both of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 256,783, Apr. 23, 1981, abandoned. This application Oct. 7, 1983, Ser. No. 539,631

Claims priority, application United Kingdom, Apr. 26, 1980, 8013857; Apr. 8, 1981, 8111023

Int. Cl.[3] G01B 7/14; G01R 33/12; G01N 27/72

U.S. Cl. 324—208 14 Claims



1. A displacement measuring transducer for measuring the displacement of a monitored object comprising a coil, an A.C. source connected to said coil, a core assembly fixedly associated with said monitored object and which is axially movable relative to said coil, said core assembly comprising a short-circuit turn and a magnetic flux concentrator arranged to enhance the flux linkage between said short-circuit turn and said coil, and measuring means connected to said coil for measuring changes in the phase relationship between the voltage and current in said coil, said core assembly being so arranged that on increasing penetration of said core assembly into said coil the inductance of said coil increases and the reflected shunt resistance across said coil decreases to provide said changes in said phase relationship.

4,502,007

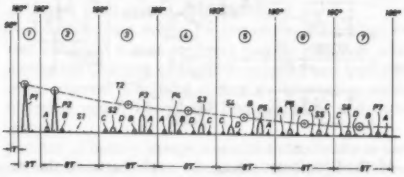
METHOD OF MEASURING NMR SPIN-SPIN RELAXATION TIME (T_2) USING SPIN-ECHOS

Gary L. Mee, 1958 Glosridge Dr., and M. Robert Willcott, 3502 Drummond, both of Houston, Tex.

Filed Jan. 31, 1983, Ser. No. 462,137

Int. Cl.[3] G01R 33/08

U.S. Cl. 324—307 5 Claims



1. A method of measuring the NMR spin-spin relaxation time (T_2) of nuclei using spin-echos comprising the steps of locating the nuclei in a static magnetic field, applying an RF pulse to the nuclei at the Larmor frequency of the nuclei of sufficient duration to rotate the net magnetic moment of the nuclei 90°, waiting a time period tau that is at least the time required for the free induction decay signal to go to zero, applying an RF pulse at the same Larmor frequency to the nuclei of sufficient duration to rotate the net magnetic moment of the nuclei 180°, recording the primary echo induced, waiting a time period equal to at least 3 tau to cause the stimulated echos produced by the inhomogeneities in the RF magnetic field to fall into separate time zones from each other and the primary echo, applying an RF pulse at the same Larmor frequency to the nuclei of sufficient duration to rotate the net magnetic moment of the nuclei another 180° to produce the primary and stimulated echos, recording the primary and error stimulated echos induced thereby during a time period sufficient to allow the peaks of all of the stimulated echos and the primary echo to appear in different time slots in the time zone, repeating the last three steps to obtain a series of frames each of which contain a primary echo and stimulated echos, adding the primary echo and related stimulated echos in each frame to obtain points on a decay curve indicating T2 relaxation time.

4,502,008

METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

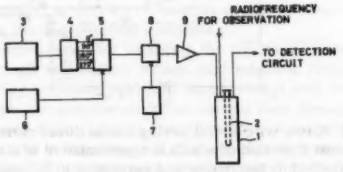
Muneki Ohuchi, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,324

Claims priority, application Japan, Feb. 19, 1982, 57-25492

Int. Cl.[3] G01R 33/08

U.S. Cl. 324—311 5 Claims



1. A decoupling method for nuclear magnetic resonance spectroscopy comprising,

repeatedly applying a pulse train to a sample for decoupling, said pulse train containing a series of radiofrequency pulses joined without interval, each radiofrequency pulse being phased at 0°, 90°, 180°, or 270°, and

reversing the phase of the radiofrequency carrier of the pulse train at the interval longer than the repetitive cycle of the pulse train asynchronously with the repetition of application of the pulse train.

4,502,009

APPARATUS ADAPTED FOR SINGLE PULSE ELECTROMAGNETIC MEASUREMENTS OF SOIL CONDUCTIVITY AND DIELECTRIC CONSTANT

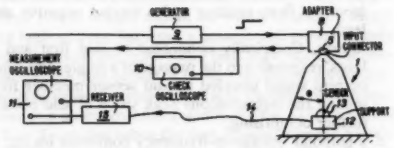
Charles Rodiere, Marly Le Roi, and Michel Crochet, Verneuil sur Seine, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 19, 1982, Ser. No. 340,592

Claims priority, application France, Jan. 20, 1981, 81 01019

Int. Cl.[3] G01V 3/12; H01Q 1/04

U.S. Cl. 324—337 16 Claims



1. An aerial simulator adapted for determination of the dielectric constant and conductivity of the ground, soil, or earth comprising

a generator means for generating electric impulses,

input connector means connected to receive electric impulses from said generator means,

a plurality of at least two conductive layers connected between said input connector means and the ground, extending outward from said input connector means in the shape of a horn open toward the ground for emitting towards the surface of the ground, at a selected incidence angle, electromagnetic pulses derived from said electric impulses received through said input connector means,

a buried structure including

conductive means connected to said conductive layers and extending under the ground for guiding said electromagnetic pulses down underground to a predetermined depth in the ground so as to radiate said pulses through an excited zone in the ground and adjacent air space,

electromagnetic field sensor means located within a space defined by said conductive layers and said buried structure for delivering a signal representative of a local resulting electromagnetic field at a predetermined point in said excited zone,

and first and second measuring means connected to receive electronic signals from said input connector means and said sensor means respectively for measuring electric and magnetic fields to determine the dielectric constant and conductivity of the ground.

4,502,010

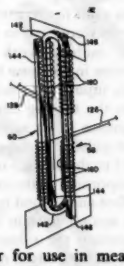
APPARATUS INCLUDING A MAGNETOMETER HAVING A PAIR OF U-SHAPED CORES FOR EXTENDED LATERAL RANGE ELECTRICAL CONDUCTIVITY LOGGING

Arthur F. Kuckes, Ithaca, N.Y., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 130,764, Mar. 17, 1980, Pat. No. 4,323,848. This application Nov. 22, 1982, Ser. No. 443,234

Int. Cl.³ G01V *3/26;* G01R *33/02*

U.S. Cl. 324—338 **16 Claims**



1. A magnetometer for use in measuring subsurface AC injected magnetic fields for borehole logging, comprising:

first and second magnetic field sensors, said first sensor lying in a first plane and said second sensor lying in a second plane;

fastening means for securing said sensors in axial alignment with the plane of said first sensor perpendicular to the plane of said second sensor;

an elongated heat-insulating housing adapted to receive said sensors, said housing having a relatively small diameter and being adapted for insertion vertically into a borehole; said first and second sensors comprising:

first and second generally U-shaped core segments each having first and second spaced, parallel, elongated leg portions extending from opposite ends of a relatively short base portion, said first and second core segments being mounted in opposite directions with said elongated leg portions of said first core segment being interleaved with said elongated leg portions of said second core segment; and

coil means disposed around said elongated leg portions of each of said first and second core segments;

circuit means connected to said coil means of each of said sensors for producing signals representing AC magnetic field components detected by said first and second sensors; and

means for securing said circuit means to at least one of said sensors.

4,502,011

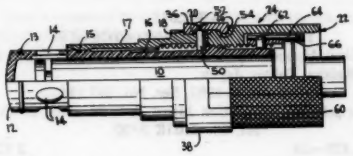
RETAINING CLAMP FOR COMBINATION VALVE AND CONDUCTIVITY CELL ASSEMBLY

Harvey A. Druker, Bethel, Conn., assignor to McNab Incorporated, Mount Vernon, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,340

Int. Cl.³ G01N *27/02*

U.S. Cl. 324—446 **4 Claims**



1. A valve and conductivity cell assembly comprising a housing adapted to be mounted on and in communication with a liquid flow conduit containing a liquid to be tested, a valve sleeve of plastic material reciprocably mounted in said housing and having a head in contact with the liquid in the flow conduit, a valve nipple mounted on the valve sleeve for reciprocation thereof, an operating safety nut for reciprocating said valve sleeve and valve nipple to and from a closed position, a conductivity cell removably mounted in said valve sleeve for reciprocation therewith and in testing contact with the liquid when the valve sleeve is in open position, a clamp having identical first and second halves each having inwardly facing flanges formed on the inner surface thereof, said valve nipple and operating safety nut having laterally outwardly projecting flanges arranged in facial confronting relation and cooperatively engaged by the inwardly facing flanges on the inner surfaces of the clamp halves, one end of each half of the clamp being attached to form a hinge for free swinging action between said halves, the other ends of said halves being releasably fixed to maintain said clamp in a closed position, said flanges being relieved adjacent the releasably fixed ends with the inner radius being reversed, retaining pin means fixedly mounted on one of said halves and extending inwardly therefrom, whereby when said clamp is mounted on said valve assembly the flanges on said clamp will engage said valve nipple and said operating safety nut without damaging the same and retain the same connected and said retaining pin will engage said valve sleeve whereby said valve nipple and said operating safety nut will be maintained in fixed position relationship during reciprocation of said valve sleeve.

4,502,012

METHOD OF DISCHARGING AN AEROSOL CONTAINER TO MEASURE CHARGE BUILDUP ON THE CONTAINER

Elton E. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

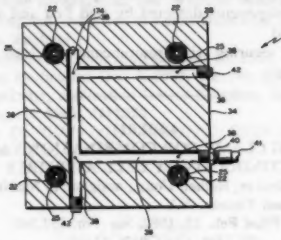
Division of Ser. No. 210,504, Nov. 26, 1980. This application Sep. 29, 1982, Ser. No. 427,225

Int. Cl.³ G01N *27/60*

U.S. Cl. 324—452 **6 Claims**

6. A method for preventing an electrical flow between a pair

of spaced apart conducting materials in flow communication with the discharge of an aerosol container comprising flowing



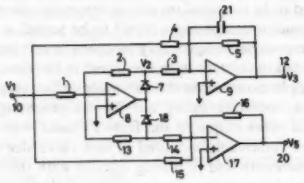
a stream of air between the pair of spaced apart conductive materials and into the discharge.

4,502,013

INPUT CONVERTING CIRCUIT

Masaji Usui, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,154
Claims priority, application Japan, Jan. 27, 1981, 56-11046
Int. Cl.³ H03K *5/00*
U.S. Cl. 328—26 **5 Claims**



1. An input converting circuit, comprising, an input terminal adapted to receive an input ac voltage;

first and second output terminals independent from one another;

a first operational amplifier circuit comprising, an operational amplifier having a grounded non-inverting input, an inverting input and an output; a first resistor connected between said input terminal and said inverting input; a first feedback circuit connected between said output and said inverting input and comprising a series connection of a second resistor and a first diode, said first diode being connected to provide current flow in said first feedback circuit only when the voltage at said input terminal is negative with respect to ground; and a second feedback circuit connected between said amplifier output and said inverting input and comprising a series connection of a third resistor and a second diode, said second diode connected to provide current flow in said second feedback circuit only when the voltage at said input terminal is positive; whereby the voltage at the point of connection between said first diode and second resistor is a negative half-wave rectified voltage, and said voltage at the point of connection between said second diode and said third resistor is a positive half-wave rectified voltage;

a second operational amplifier circuit comprising, a second operational amplifier having a grounded non-inverting input, an inverting input, and an output; a fourth resistor connected between said inverting input and the connection point of said first diode and second resistor; a fifth resistor connected between said inverting input and said input terminal; and a sixth resistor connected between said output and said inverting input; said output of said second operational amplifier being connected to the first output terminal of said converting circuit and providing a negative fullwave rectified voltage output,

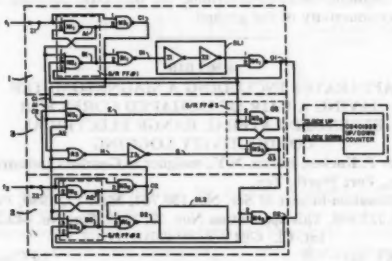
a third operational amplifier circuit comprising, a third operational amplifier having a grounded non-inverting input, an inverting input, and an output; a seventh resistor connected between said inverting input and the connection point of said second diode and third resistor; an eighth resistor connected between said inverting input and said input terminal; and a ninth resistor connected between said output and said inverting input; said output of said third operational amplifier being connected to the second output terminal of said converting circuit and providing a positive full-wave rectified voltage output of opposite polarity to that provided at said first output terminal.

4,502,014

COINCIDENT PULSE CANCELLING CIRCUIT

Otto H. Bismarck, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,164
Int. Cl.³ H03K *21/06, 19/21*
U.S. Cl. 328—110 **3 Claims**



1. The combination comprising:

first and second inputs each for receiving input pulses;

first and second networks coupled to said first and second inputs, respectively, each network including a storage means set to a first state in response to the leading edge of an input pulse at its input, and each network including means responsive to the trailing edge of the input pulse and to its storage means being set to said first state for producing an output pulse at a respective output; and

control means, coupled to the storage means of said first and second networks, responsive to the coincident presence of input pulses at said first and second inputs for resetting the storage means to a second state in said first and second networks and preventing the subsequent production of output pulses on the trailing edges of the input pulses.

4,502,015

DIODE DETECTOR WITH LINEARITY COMPENSATING CIRCUIT

John F. Nicholas, Liverpool, and Edward A. Salvagni, Camillus, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,142
Int. Cl.³ H03D *1/10*
U.S. Cl. 329—166 **4 Claims**

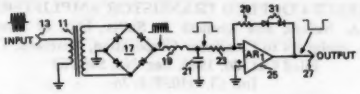
1. A linear detector circuit comprising:

(a) a detector bridge including an input terminal and paired semiconductor diodes connected to provide full wave rectified output from a modulated carrier input applied to said input terminal;

(b) low pass filter means connected to the output of said detector bridge for removing carrier frequency components from said bridge output;

(c) an operational amplifier connected to receive the signal passed by said filter and to provide a buffered output to a load; and

(d) means for nonlinearizing the gain of said operational amplifier including a feedback loop around said amplifier



containing at least one diode having operational characteristics matched to those of said bridge diodes, whereby the nonlinearity thus given the amplifier gain characteristics may compensate for nonlinearity in impedance of said detector bridge with variations in temperature and input signal level.

4,502,016

FINAL BRIDGE STAGE FOR A RECEIVER AUDIO AMPLIFIER

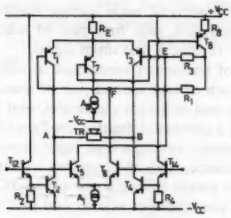
Marco Siligoni, Vittuone, and Pietro Consiglio, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Aug. 13, 1982, Ser. No. 407,785

Claims priority, application Italy, Aug. 26, 1981, 23646 A/81

Int. Cl.³ H03F *3/183, 3/45*

U.S. Cl. 330—146 **12 Claims**



1. A final bridge stage for a receiver audio amplifier operating at a low voltage, which is monolithically integratable and useable to control an electroacoustic transducer having first and second terminals;

said stage comprising first, second, third, and fourth semiconductor circuit elements, each element having at least a first terminal, a second terminal, and a control terminal;

said first and third circuit elements having a first type of conductivity, and said second and fourth circuit elements having a second type of conductivity which is opposite to the first type of conductivity;

a first terminal of said first and third circuit elements being connected to a first pole of a supply voltage generator through a common constant current generator means;

a first terminal of said second and fourth circuit elements being connected to a second pole opposite to the first pole of said supply voltage generator;

a second terminal of said first circuit element being connected to a second terminal of said second circuit element, said connection constituting a first terminal to which said first terminal of said electroacoustic transducer is connected;

a second terminal of said third circuit element being connected to a second terminal of said fourth circuit element, said connection constituting a second terminal to which said second terminal of said electroacoustic transducer is connected;

a control terminal of said second circuit element and a control terminal of said fourth circuit element being connected to a signal source which controls such circuit elements so as to operate in phase opposition to each other;

said stage further comprises a fifth and a sixth semi-conductor circuit element, each having a conductivity of the second type and each having at least a first terminal, a second terminal, and a control terminal, the first terminal of each such circuit elements being connected to the second pole of said supply voltage generator through another common constant current generator means, the control terminals of said fifth and said sixth circuit elements being connected to a signal source, which controls said fifth and said sixth circuit elements so as to operate in phase opposition to each other and in phase respectively with said second and said fourth circuit elements;

the second terminal of said fifth circuit element being connected to both the control terminal of said third circuit element and through a first resistor element to a circuit means for generating a reference voltage, the second terminal of said sixth circuit element being connected to both the control terminal of said first circuit element and through a second resistor element to said circuit means for generating a reference voltage.

4,502,017

OPERATIONAL AMPLIFIER HAVING FREQUENCY COMPENSATION

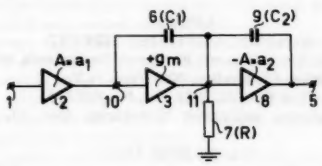
Rudy J. Van de Plassche, and Eise C. Dijkmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,569

Claims priority, application Netherlands, Oct. 19, 1982, 8204024

Int. Cl.³ H03F *1/14*

U.S. Cl. 330—151 **2 Claims**



1. An operational amplifier comprising at least a first amplifier stage, a second amplifier stage driven by the first amplifier stage, and a first and a second junction point, a first capacitive signal path for improving the high-frequency properties of the operational amplifier between said junction points, which first junction point is coupled to an output of the first amplifier stage and which second junction point is coupled to an output of the second amplifier stage, the gain from the first junction point to the second junction point being non-inverting and the impedance of the output of the second amplifier being high relative to the impedance of the first junction point, characterized in that the output of the second amplifier stage is connected to an input of a third amplifier stage having an output coupled to a third junction point, a second capacitive signal path between the second and the third junction points, which third amplifier stage is inverting between the second and the third junction points, so that said third amplifier stage in conjunction with the second capacitive signal path exhibits a Miller effect.

4,502,018

GAIN REGULATION CIRCUIT FOR AN AMPLIFIER CIRCUIT

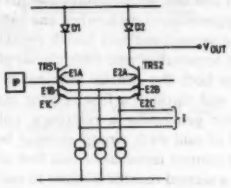
Peter F. Blomley, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

PCT No. PCT/GB82/00070, § 371 Date May 5, 1983, § 102(e) Date May 5, 1983, PCT Pub. No. WO83/03177, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 4, 1982, Ser. No. 491,688

Int. Cl.³ H03F *3/45;* H03G *3/30*

U.S. Cl. 330—254 **8 Claims**



1. A gain regulator and signal amplifier circuit for an electronic telephone subset, said circuit comprising a first long tailed pair of transistors having substantially identical characteristics, and 2n further long tailed pairs of transistors, where n is an integer including unity, wherein corresponding transistors of said 2n further pairs have emitter areas in the ratio 1:a; a:1, where a lies between zero and unity, whereby gain maxima of gain characteristics corresponding to said 2n further pairs are symmetrically disposed about signal zero of a circuit gain characteristic so as to provide together said circuit gain characteristic having a substantially constant gain region of significantly lower gain than gain maxima of said first long tailed pair, and wherein said circuit further includes control means coupled to emitters of said first pair and said 2n further pairs whereby weighted contributions to said circuit gain characteristic may be provided for said first long tailed pair and from said 2n further pairs so as to provide a stage gain adjustable between limits defined by the gain of said first pair and the gain of said 2n further pairs.

4,502,019

DYNAMIC AMPLIFIER CIRCUIT

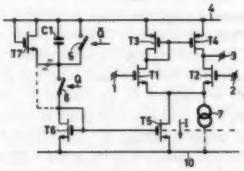
Arthur H. M. Van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,656

Claims priority, application Netherlands, Dec. 31, 1981, 8105919

Int. Cl.³ H03F *3/16*

U.S. Cl. 330—261 **2 Claims**



1. A dynamic amplifier circuit for amplifying a signal in a first time interval under control of a clock signal, which circuit comprises a bias circuit for obtaining a bias current in the amplifier circuit during said first time interval, which bias current decreases from an initial value, characterized in that the bias circuit comprises an additional source for obtaining a current in the amplifier circuit, which current is substantially constant relative to said bias current and has a comparatively small value relative to the said initial value in order to define the minimum bias current in the amplifier circuit at the end of said time interval.

4,502,020

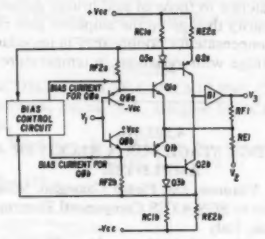
SETTLING TIME REDUCTION IN WIDE-BAND DIRECT-COUPLED TRANSISTOR AMPLIFIERS

David A. Nelson, and Kenneth R. Saller, both of Loveland, Colo., assignors to Comlinear Corporation, Loveland, Colo.

Filed Oct. 26, 1983, Ser. No. 545,753

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—265 **36 Claims**



1. A wide-band, variable gain, differential input, DC-coupled amplifier employing current feedback to enhance the settling time characteristic of the amplifier, the amplifier comprising:

a first pair of transistors each having emitter, base, and collector electrodes, said first pair of transistors being connected to receive a first input signal;

a second pair of transistors connected to said first pair of transistors, each of said second pair of transistors having emitter, base, and collector electrodes, and being further connected in a command emitter configuration;

inverting gain means having a high input impedance, a high output impedance, and an inverting voltage gain, said inverting gain means having a pair of inputs connected to the collector electrodes of said second pair of transistors;

unity gain means having a high input impedance and a low output impedance, said unity gain means having an input connected to an output of said inverting gain means;

first resistor means connected between an output of said unity gain means and the common emitter electrodes of said second pair of transistors to provide a feedback path therebetween; and

second resistor means connected between the common emitter electrodes of said second pair of transistors and a second input signal.

4,502,021

CONSTANT BANDWIDTH AUTOMATIC GAIN CONTROL SYSTEM

John P. Hill, Broomfield, and James J. Touchton, Boulder, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Mar. 31, 1983, Ser. No. 481,084

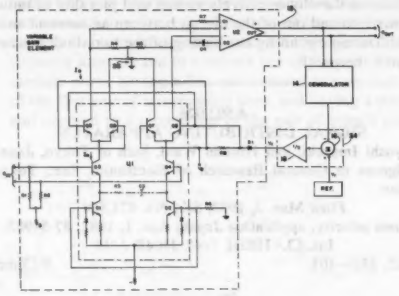
Int. Cl.³ H03G *3/10*

U.S. Cl. 330—279 **11 Claims**

1. In an automatic gain control (AGC) system, a method of maintaining a relatively constant automatic gain control loop bandwidth that is independent of input signal level, said AGC loop comprising a variable gain element that relates an output signal, e_{OUT}, to an input signal, e_{IN}, as expressed by the relationship $e_{OUT}=b\,e_{IN}$, where b is the gain of said variable gain element, and further where the value of b has a maximum value of 1.0, which value is determined by a control signal, said control signal being a function of an error signal, and wherein said error signal is the difference between a reference signal

and a feedback signal derived from said output signal e_{OUT}, said method comprising the steps of:

(a) varying the value of b with said control signal, such that



b changes inversely proportional to e_{IN}, whereby the product be_{IN}, and hence e_{OUT}, remains substantially constant; and

(b) limiting the value of b to a value that is no more than 0.5.

4,502,022

SUPPORT FOR AN OSCILLATOR

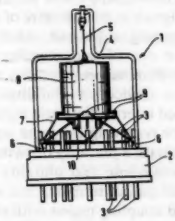
André Stahl, Orsay; Daniel Munier, Torcy, and André Bertrand, Chaville, all of France, assignors to Quartz & Electronique Alcatel, Asnieres, France

Filed Mar. 29, 1983, Ser. No. 480,159

Claims priority, application France, Mar. 30, 1982, 82 05422

Int. Cl.³ H03B *1/00*; H03H *9/10*

U.S. Cl. 331—68 **4 Claims**



1. An oscillator support comprising a connection base fitting, a hood covering said base fitting and being sealably mounted thereto, the improvement comprising a bracket mounted on said base fitting within said hood, a first wire suspending an oscillator from said bracket above said base fitting, and a second wire connected alternately at spaced positions about said base fitting to the base fitting and to the base of the oscillator at a plurality of fixing points for drawing said oscillator towards said base fitting.

4,502,023

METHOD OF FABRICATING A VARACTOR/OSCILLATOR DIODE MODULE FOR A TUNABLE OSCILLATOR

Michel Heitzmann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 14, 1982, Ser. No. 388,157

Claims priority, application France, Jun. 19, 1981, 81 12145

Int. Cl.³ H01L *23/32*; H03B *7/14*

U.S. Cl. 331—107 R **7 Claims**

1. A method of fabricating a module having an oscillator diode and a varactor diode mounted in series, said method comprising the steps of:

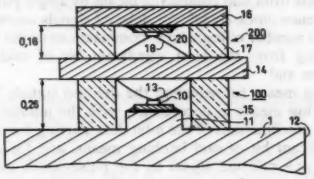
(A) mounting one of the diodes by welding one of its anode and cathode on a first metallic base which performs the function of a thermal radiator and of a electrode of the module, and thus forming a first subassembly;

(B) mounting the other diode by welding one of its anode and cathode on a second metallic base which performs the function of a second electrode of the module, and thus forming a second subassembly;

(C) equipping each subassembly with a dielectric ring having a first flat face welded to the respective base, said ring surrounding the respective diode so as to provide a second flat face parallel to said first face and forming together with the base surface delimited by the ring and internal walls of said ring, a cylinder which entirely contains the respective diode;

(D) bonding flexible connection so as to connect the other one of said anode and cathode which has remained free in each diode to the second flat face of the respective ring; and

(E) mounting the two subassemblies so that the same face each other with their flat faces bonded to the flexible connections, and welding the same to a third electrode of the module, said third electrode being formed by a metallic disk having a diameter of a size so as to readily obtain oscillation of the oscillator diode at a predetermined frequency.



6. A tunable oscillator incorporating a module comprising an oscillator diode and a varactor diode mounted in series, wherein the module comprises:

one of said diodes having one of its anode and cathode welded on a first metallic base which performs the function of a thermal radiator,

the other of said diodes having one of its anode and cathode welded on a second metallic base,

a metallic disk placed between the two diodes, parallel to the first and second metallic base and connecting the two diodes in series with the help of flexible connections,

two dielectric rings, each ring being placed between the metallic disk and one of the metallic bases in order to enclose the respective diode,

said tunable oscillator comprising a cavity provided with three openings through which are introduced respectively the module with the help of its first metallic base, a first biasing rod placed in contact with the metallic disk, and a second biasing rod placed in contact with the second metallic base.

4,502,024

PULSE-WIDTH MODULATION CIRCUIT

Meisei Nishikawa, Yokohama; Masahide Nagumo, Kawasaki, and Tadashi Kojima, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 10, 1983, Ser. No. 473,763

Claims priority, application Japan, Jun. 15, 1982, 57-102821; Dec. 22, 1982, 57-225217

Int. Cl.³ H03K *7/08*

U.S. Cl. 332—9 R **3 Claims**

1. A pulse-width modulation circuit, characterized by comprising:

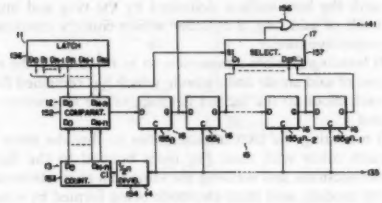
N-bit latching means for holding count data obtained by counting a reference clock signal in accordance with a period of a signal to be modulated;

frequency dividing means for frequency-dividing the reference clock signal by $\frac{1}{n}$ (N>n);

(N−n)-bit counting means for counting an output from said frequency dividing means at a predetermined period;

comparing means for comparing (N−n)-bit count data from said counting means and (N−n)-bit count data which is held in said latching means and which excludes n-bit data starting from a least significant bit of said latching means, and for producing a pulse-width modulation signal;

delaying means for producing delayed signals by delaying



outputs from said comparing means by single pulses of the reference clock signal, the delayed signals corresponding to the number of logic level combinations of the n-bit data starting from the least significant bit of said latching means; and

selecting means for selecting the delayed signals from said delaying means in accordance with the number of logic level combinations of the n-bit data starting from the least significant bit of said latching means, and for adding at least one selected signal to the pulse-width modulation signal.

4,502,025

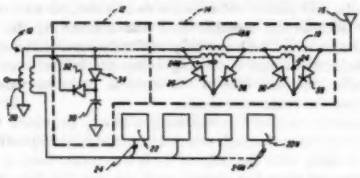
HIGH SPEED PIN DIODE SWITCHED ANTENNA COUPLER AND METHOD

Robert H. Carl, Jr., Rochester; Floyd Koontz, Holcomb, and Daniel F. Pedtke, Fairport, all of N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 23, 1982, Ser. No. 371,247

Int. Cl.³ H03H *1/00, 7/00*

U.S. Cl. 333—24 R **14 Claims**



1. A high speed antenna coupler for electrically coupling an antenna to a utilization circuit comprising:

a plurality of inductors each having an axial passageway and wound to a predetermined value of inductance, each of said inductors being apertured adjacent the mid-length thereof;

a plurality of PIN diodes each having an anode connected to one end of one of said plurality of inductors, the cathodes of the two diodes connected to each of said inductors being interconnected,

a driver circuit for each of said plurality of inductors;

a plurality of control wires each connected between one of said plurality of driver circuits and one of said interconnections,

each of said control wires passing through the axial passageway of those of said plurality of inductors intermediate the one of said plurality of driver circuits and the one of said plurality of inductors to which connected, and each passing through the aperture in the one of said plurality of inductors to which connected; and

means for selectively operating said plurality of driver circuits to thereby selectively switch said plurality of inductors into and out of the circuit between an antenna and a utilization circuit by the biasing of the two diodes associated therewith.

4,502,026

SIGNAL DISTRIBUTING APPARATUS

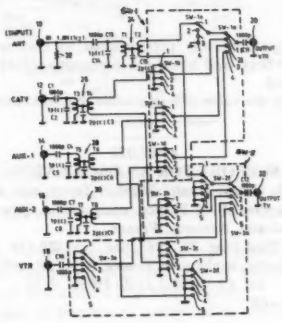
Kazuyoshi Imazeki, and Hisashi Wani, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,894

Claims priority, application Japan, Apr. 1, 1982, 57-54983

Int. Cl.³ H03H *7/48;* H04B *1/16*

U.S. Cl. 333—101 **9 Claims**



9. A signal distributing apparatus for distributing each of a plurality of input signals to one or more of a plurality of utilization devices comprising: a plurality of input terminals, each coupled to receive one of said plurality of input signals; a plurality of output terminals respectively coupled to said plurality of utilization devices; a plurality of coupling means respectively coupled intermediate said input terminals and said output terminals for receiving the input signals from said plurality of input terminals; a plurality of switching means respectively coupled intermediate said plurality of coupling means and said plurality of output terminals for selectively interconnecting each of said coupling means with each of said plurality of output terminals; said coupling means comprising means for coupling the input signals to the switching means substantially without interference between the input signals or between the output utilization devices and substantially without input losses; wherein said plurality of utilization devices and said plurality of output terminals are respectively two in number; and wherein one of said two utilization devices additionally supplies an additional input signal to an additional input terminal.

4,502,027

BIDIRECTIONAL SWITCH

Yalcin Ayasli, Waltham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 353,118, Mar. 1, 1982,. This application Oct. 24, 1983, Ser. No. 545,102

Int. Cl.³ H01P *1/15*

U.S. Cl. 333—103 **5 Claims**

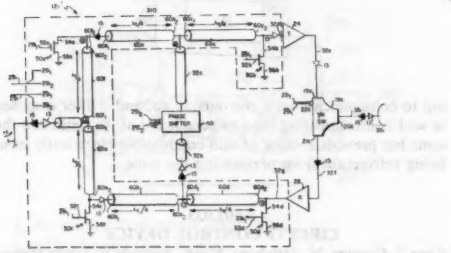
3. A switching element having a common port, a pair of branch ports, and a pair of intermediate ports comprising:

means for providing an electrical path between the pair of intermediate ports;

a first pair of transmission lines coupled together at a first common junction and to the common port;

a second pair of transmission lines coupled together at a second common junction and to a first one of the pair of intermediate ports, having a first end coupled to a first end of the first pair of transmission lines, and having a second end coupled to a first one of the pair of branch ports;

a third pair of transmission lines coupled together at a third common junction and to a second one of the pair of intermediate ports, having a first end coupled to a second end of the first pair of transmission lines, and having a second end coupled to a second one of the pair of branch ports;



a first pair of transistors, each transistor having output and control electrodes, with the output electrode of each one of such transistors being coupled to a corresponding end of the second pair of transmission lines; and

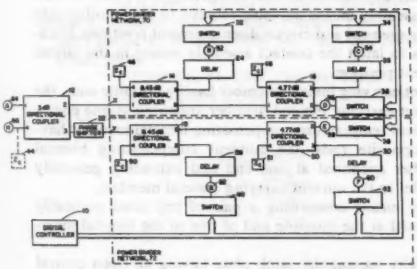
a second pair of transistors, each transistor having output and control electrodes, with the output electrode of each one of such transistors being coupled to a corresponding end of the third pair of transmission lines.

4,502,028

PROGRAMMABLE TWO-PORT MICROWAVE NETWORK

Bernard W. Leake, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 15, 1982, Ser. No. 388,781
Int. Cl.³ H01P *5/18*
U.S. Cl. 333—109 **51 Claims**



1. An adjustable two-port network for generating a discrete number of reflection and transmission coefficients comprising:

a four-port reciprocal coupling means for dividing an input signal into two isolated output signals;

means for providing a phase shift to a first one of said output signals;

means coupled to a second one of said output signals and said phase shift means for producing in response to a control signal a selected one of a plurality of reflections comprising different discrete amplitudes with similar phase, thereby producing said discrete number of reflection and transmission coefficients of said two-port network; and

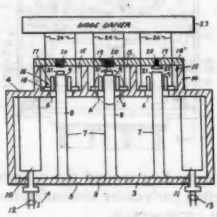
digital controller means for generating said control signal, thereby selecting any one of said discrete number of reflection and transmission coefficients.

4,502,029

EXTENDED RESONATOR ELECTRONICALLY TUNABLE BAND PASS FILTER

Robert E. Reed, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,542
Int. Cl.³ H01P *1/205*
U.S. Cl. 333—203 **29 Claims**



1. A narrow band pass filter electronically tunable over a predetermined frequency range by signals issued by an electronic drive, comprising

a housing bounding a tuned cavity and having two opposite walls one of which has a plurality of through openings;

a plurality of resonators each extending from the other of said opposite walls toward one of said through openings and each having an extension projecting through the respective opening to the exterior of said tuned cavity;

a set of tuning capacitors for each of said resonators, including capacitor plates arranged around the respective extension externally of said tuned cavity; and

means for selectively activating and deactivating said capacitor plates in dependence on said signals to thereby include the respective tuning capacitors of the respective sets in, and exclude the same from, electric circuit with the respective resonators, and thus to vary the tuned frequency band of the filter.

4,502,030

HIGH RELIABILITY SOLENOID SWITCH

Peter J. Caruso, Wayne, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 26, 1983, Ser. No. 526,850
Int. Cl.³ H01H *9/20*
U.S. Cl. 335—164 **8 Claims**

6. Switching assembly having at least one make-or-break connection, which is switchable between a first status and a second status in response to electrical signals, characterized by:

(a) solenoid means providing force in response to the electrical signals;

(b) a moveable switch armature, the status of the make-or-break connection being controlled by reciprocal movement of the switch armature, the armature being connected to the solenoid means so that force from the solenoid biases the armature in order to effect that reciprocating movement when the solenoid responds to said electrical signals;

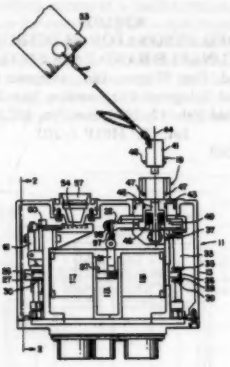
(c) means to rotate the armature in response to said reciprocal movement;

(d) the armature having a cylindrical portion;

(e) a plurality of contact members establishing said make-or-break connection with at least one shorting bar and juxtaposed to the cylindrical portion; and

(f) the cylindrical portion including a dielectric surface

interrupted by said shorting bar, the shorting bar being substantially flush with the outer surface of the cylindrical



portion and extending around the cylindrical portion so that the shorting bar's outer circumference has a substantially circular cross-section.

4,502,031

ELECTROMAGNET AND METHOD OF PRODUCING THE SAME

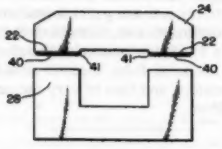
Haruhiko Ito, and Mineo Sano, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,508

Claims priority, application Japan, Sep. 24, 1981, 56-141515[U]

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—277 **9 Claims**



1. In an electromagnet in which an attractive force is generated between a moving and a fixed-iron core by a d.c. current or rectified a.c. current, the improvement comprising a melt-type adhesive layer of a thermally-melting adhesive composed of an oxygen-free copper or silver solder provided on at least one contacting electrode surface of the moving-iron core and the fixed-iron core, and a thin non-magnetic plate for preventing attraction between said cores due to remanence fixed through said melt-type adhesive layer onto said contacting electrode surface.

4,502,032

EBULLITION COOLED TRANSFORMER

Minoru Kimura, Itami, and Hisamitsu Takahashi, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

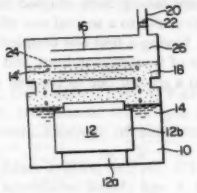
Filed Feb. 16, 1984, Ser. No. 580,637

Claims priority, application Japan, Apr. 21, 1983, 58-71305

Int. Cl.³ H01F *27/10*

U.S. Cl. 336—58 **3 Claims**

1. An ebullition cooled transformer comprising a housing, a core and coil assembly fixedly disposed on a lower portion of said transformer, an amount of a condensible electrically insulating refrigerant charged into the lower portion of said housing to immerse said core and coil assembly therein, a cooler unit disposed above said core and coil assembly within said housing, a communicating tube disposed at a top of said housing to communicate with the outside air, and a filter disposed in said communicating tube to permit the air to permeate the same but prevent a vapor of said condensible electrically insulating refrigerant from permeating the same.



4,502,033

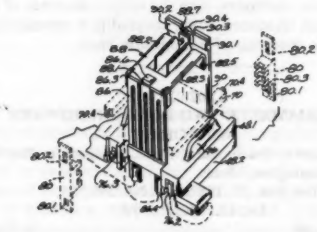
CIRCUIT CONTROL DEVICE

Aime J. Grenier, N. Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,534

Int. Cl.³ H01H *71/16*

U.S. Cl. 337—75 **9 Claims**



1. A circuit control device comprising first and second contact assembly means movable relative to one another into circuit engagement and circuit disengagement positions, latching means to latch the contact assembly means in the circuit engagement position,

a current carrying bimetal member having opposite ends, the current carrying bimetal member anchored at one end,

an ambient temperature compensating bimetal member having opposite ends, the ambient compensating bimetal member anchored at one end and extending generally parallel to the current carrying bimetal member,

trip arm means comprising a pair of trip arms pivotably mounted at the opposite end of one of the bimetal members,

a generally rectangular latch plate having an open central portion and having first and second opposite ends attached to the opposite end of the other bimetal member, the latch plate having a latch surface formed at the first end of the plate adapted to engage the trip arms, the trip arms extending through the open central portion, the latch surface location moving with changes in ambient temperature to maintain generally the same spatial relationship with the trip arm means,

the latching means being interconnected with the trip arm means, and

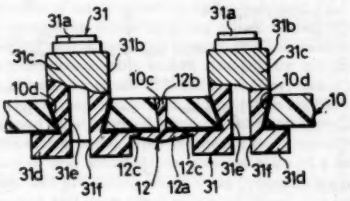
biasing means adapted to place a selected bias on the latching means tending to maintain the contact assembly means latched in the circuit engagement position only when the trip arm means are in engagement with the latch surface.

4,502,034

ELECTRIC COMPONENT

Satsuo Endo, Ishinomaki, Massaru Saito, Miyagi, and Yoshihiro Ohashi, Miyagi, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,787
Claims priority, application Japan, Aug. 25, 1982, 57-146185; Oct. 18, 1982, 57-181443
Int. Cl.³ H01C *10/16*
U.S. Cl. 338—128 12 Claims



1. An electric component comprising

a holder having shaft holes;

a plurality of rotary members, each consisting of a shaft portion fitting into a respective one of said shaft holes of said holder, an operation portion formed integrally with said shaft portion, and a driving portion;

a connection member for connecting each of said rotary members to at least one other rotary member adjacent to said rotary member; and a break-off portion formed on said connection member, capable of breaking easily when each of said rotary members is forced to rotate; each of said rotary members becoming rotatable with respect to said holder when said break-off portion breaks off; wherein said connection member consists of a connecting portion connecting said rotary members with each other via break-off portions, and a holding portion embedded into said holder and preventing said connecting portion from falling off even when said connecting portions are broken off from said rotary members.

4,502,035

GOLFER'S HEAD MOTION SENSOR

James E. Obenauf, 8457 E. Desert Steppes, Tucson, Ariz. 85710, and Charles E. Brodish, 8805 SE. 78th. St., Mercer Island, Wash. 98040

Filed Jul. 11, 1983, Ser. No. 512,236
Int. Cl.³ G08B *23/00, 21/00;* A63B *69/36*
U.S. Cl. 340—323 B 9 Claims

1. A device for sensing and in real time indicating movement of a golf player's head comprising:

a motion sensor operably attached to the head of a golf player, said motion sensor continuously outputting an electrical signal proportional to the movement sensed;

a signal processing unit to receive signals from said motion sensor and to output a continuously processed signal; and

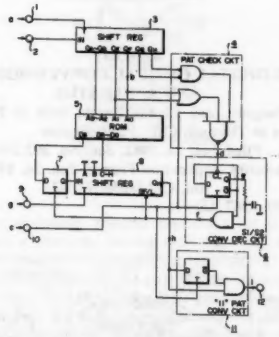
an audio output device adapted to receive the output from said signal processing unit and give audio indication of the movement sensed whereby said audio output device indicates audibly to the golf player that his head is moving.

4,502,036

ENCODING AND DECODING SYSTEMS FOR BINARY DATA

Teruo Furukawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Chiyodaku, Japan

PCT No. PCT/JP81/00253, § 371 Date Feb. 17, 1982, § 102(e) Date Feb. 17, 1982, PCT Pub. No. WO83/01141, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 25, 1981, Ser. No. 355,548
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD 2 Claims



1. A binary data encoding system for converting a first sequence of binary data into a second different converted sequence of binary data, said system comprising:

a means for converting respective data groups from said first sequence into corresponding 6-bit data groups of said second sequence when a 4-bit data group corresponds to any one of a predetermined set of thirteen 4-bit data groups according to the following table:

Original Data	SI ⟷	Converted Code
1100	⟷	X00000
1101	⟷	X00001
1110	⟷	X00101
1111	⟷	010101
1000	⟷	X01001
1001	⟷	010001
1010	⟷	X00010
1011	⟷	X01010
0100	⟷	010010
0101	⟷	X00100
0110	⟷	010100
0111	⟷	X01000
0000	⟷	010000

wherein X is a complementary logic value of a code bit immediately preceding said code bit X in said converted sequence;

second means for converting 6-bit data groups from said first sequence into corresponding 9-bit data groups of said second sequence when said 4-bit data group does not correspond to any of said predetermined set of thirteen 4-bit data groups, said second converting means convert-

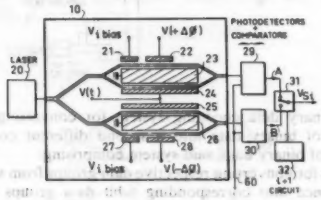
ing said 6-bit data groups according to the following table:

Original Data	S2	Converted Code
000100	⟷	X00010001
000101	⟷	X00100001
000110	⟷	X01000001
000111	⟷	X01010001
001000	⟷	010000001
001001	⟷	010010001
001010	⟷	010100001
001011	⟷	X00010000
001100	⟷	X01010000
001101	⟷	010010000
001110	⟷	X00100000
001111	⟷	010100000
		X01000000

4,502,037
ANALOG-DIGITAL OPTICAL CONVERSION PROCESS AND APPARATUS

Guy Le Parquier, and Claude Puech, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 25, 1982, Ser. No. 392,245
Claims priority, application France, Jun. 26, 1981, 81 12614
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD 11 Claims



11. An optical analog-digital converter apparatus, comprising:

a coder including: (1) n channels corresponding to n bits of a digital output word; (2) n light intensity modulators, each having an electrooptical material substrate on which a two-armed interferometer is arranged, wherein each one of said n light intensity modulators corresponds to one of said n channels; and (3) at least two electrodes arranged on each of said substrates of said n light intensity modulators in the vicinity of at least one of said interferometer arms, wherein a potential difference representing a signal V(t) to be digitized is applied to all the interferometers;

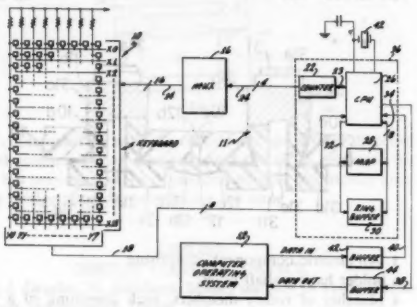
means for detecting the positive and negative half-cycles of output signals from each of said n channels of said coder, said detecting means comprising a photodetector followed by a comparator, coupled to each of said n channels; and

means for applying another potential difference to one of the two arms of each interferometer so as to successively produce a phase shift of $+\Delta\Phi$ and $-\Delta\Phi$ as a function of the positive or negative half-cycles of a signal representing an i+1 channel of said n channels whose significance is immediately below that of an ith channel, wherein i varies between 1 and n and the digital output word is output in Gray code form.

4,502,038
KEYBOARD SCANNING AND INTERFACE METHOD AND CIRCUIT

Richard W. Lowenthal, Los Gatos; Stephen C. Seike, Sunnyvale, and Gregory V. Walsh, Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.

Filed Oct. 15, 1981, Ser. No. 311,511
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S 14 Claims



1. A method for communicating keyed input information comprising the steps of:

scanning a keyboard to detect activated keys;

memorizing said activated keys;

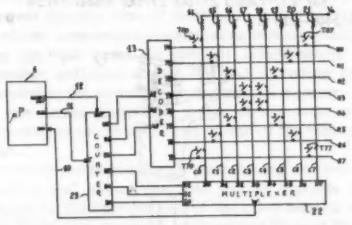
generating from the memorized keys a binary word having a bit length defined by the number of activated keys detected during one scan of said keyboard, said word having an identifiable byte corresponding to each of said memorized keys; and

communicating said binary word.

4,502,039
KEYBOARD CODING APPARATUS

Arturo Vercesi, Rho, and Francesco Marzocca, Milan, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Apr. 30, 1982, Ser. No. 373,769
Claims priority, application Italy, May 7, 1981, 21539 A/81
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S 6 Claims



1. Keyboard coding apparatus and control apparatus interconnected through an interface consisting of a minimum number of interconnecting signals lines, said keyboard coding apparatus including:

a keyboard having a plurality of keys; and,

scanning means connected to select each of said keys in a predetermined sequence for detecting the actuated non-actuated state of said each of said keys, said scanning means having first and second input terminals and an output terminal; and,

said control apparatus including:

memory means having a plurality of locations for storing control programs and predetermined locations for storing character codes related to the selection of said keys; and,

processing means coupled to said memory means, said processing means having an internal register for storing a value for accessing said predetermined locations and first and second output terminals and an input terminal connected to said first and second input terminals and to said output terminal respectively of said scanning means providing said interface consisting of said minimum number of interconnecting signal lines; and,

said processing means applying pulses to said first and second output terminals respectively for resetting said scanning means to a known state and for conditioning said scanning means to select a next key, said scanning means in response to each of said pulses applied to said second input terminal being operative to apply to said processing means input terminal a logic signal indicative of said actuated/non-actuated state of a selected key, said processing means being operative in response to each said logic signal indicative of said non-actuated state of said key to transfer another pulse to said second input terminal of said scanning means and concurrently increment by one said value stored by internal register and said processing means being operative in response to said each logic signal indicative of said actuated state of said selected key to address one of said predetermined locations of said memory means specified by said value stored in said internal register for accessing a character code representative of said selected key and thereafter transfer said another pulse to said scanning means and concurrently increment said internal register value.

4,502,040

KEYBOARD HAVING KEYS ACTIVATED BY ELECTRICAL CONTACTS AND THE CAPACITY TO READ ONE STATE FROM AMONG FOUR POSSIBLE STATES

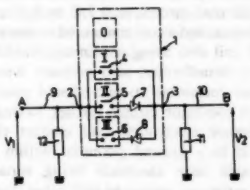
Michel Castel, Fenouillet, France, assignor to Renix Electronique, Toulouse Cedex, France

Filed Jun. 23, 1982, Ser. No. 391,291

Claims priority, application France, Jun. 23, 1981, 81 12338

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 R **3 Claims**



1. A keyboard comprising:

plural keys each having respective electrical contacts;

a pair of terminals between which at least a group of three of said contacts are positioned, said group of three contacts disposed in parallel and including respective connectors to said terminals,

wherein said group of three contacts comprises a first contact having short-circuit connectors to said pair of terminals, a second contact connected in series with a first diode between said pair of terminals, and a third contact connected in series with a second diode between said pair of terminals, said first and second diodes connected with opposite polarity relative to said pair of terminals;

means for successively applying reverse voltages to said terminals; and

a logic detector for reading the states of said contacts upon successive application of said reverse voltages to determine which if any of said keys are depressed.

4,502,041

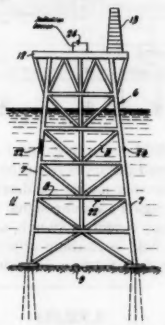
STRUCTURE FAILURE DETECTOR WITH SIGNAL TRANSMISSION THROUGH THE STRUCTURE ITSELF

Joseph Penzien, Lafayette, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 3, 1982, Ser. No. 373,967

Int. Cl.³ G08B *1/00*; G01F *23/00*

U.S. Cl. 340—532 **3 Claims**



1. A structural failure detector especially for an offshore tower wherein a platform having well-servicing machinery transmitting vibrations at frequencies associated with said servicing machinery is supported on a hollow frame extending beneath the water comprising a signal generator adapted to generate a signal having a frequency distinct from said frequencies associated with said servicing machinery and to transmit said signal at said distinct frequency through said hollow frame to said platform, means connected to said hollow frame and effective to activate said signal generator to generate a signal at said distinct frequency in response to leakage of water into said hollow frame, and means on said platform for receiving from and through said hollow frame said signal having said distinct frequency and for indicating receipt of said signal having said distinct frequency.

4,502,042

PROXIMITY SWITCH, WHICH INDICATES THE PRESENCE OR ABSENCE OF FIELD CHANGING OBJECTS AT A DEFINED DISTANCE FROM THE PROXIMITY SWITCH BY A BINARY SIGNAL WITH THE AID OF EXCITATION AND DETECTION OF A FIELD

Arno Wührl, Mülheim, and Werner Kistner, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,378

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112560

Int. Cl.³ G08B *21/00, 13/26*

U.S. Cl. 340—568 **4 Claims**

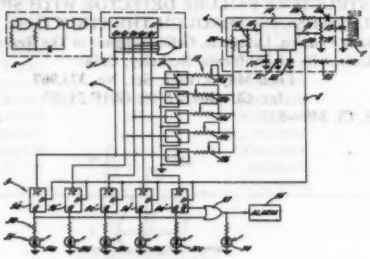
1. A multi-position proximity switch comprising, in combination:

proximity detecting switch means having a field exciting transducer and a binary output for indicating the presence or absence of a field perturbing object at a preselected distance from the field transducer and an electronic gain control input for adjusting said preselected distance,

digital-controlled gain adjusting means having a digital input and an electronic output for generating an electronic gain

control signal in response to the digital input, the electronic output being connected to the gain control input of the proximity detecting switch,

digital scanning means for generating a digital time-varying scanning signal, the digital signal being applied to the digital-controlled gain adjusting means, thereby adjusting the proximity detecting switch to detect the presence or



absence of a field perturbing object at a plurality of difference preselected distances from the field transducer, and

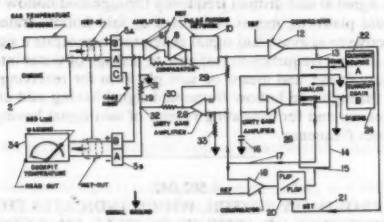
coincidence detecting means for detecting the coincidence between the digital scanning signal and the binary output of the proximity detecting switch, so that the presence or absence of a field perturbing object at each preselected distance from the field transducer is detected.

4,502,043

ENGINE TEMPERATURE TRANSIENT COMPENSATING CIRCUIT

M. Samuel Moore, Northridge, Calif., assignor to Semco Instruments, Inc., North Hollywood, Calif.

Filed Mar. 12, 1982, Ser. No. 357,587
Int. Cl.³ G01M *15/00*
U.S. Cl. 340—588 **14 Claims**



1. An engine transient compensating circuit comprising:

means for sensing the temperature of an engine which may have a harmless overtemperature transient for a predetermined period of time, and for providing a signal representing said temperature;

means for generating an opposing compensating signal modified to reduce said transient, for a period of time approximately said predetermined period of time, including a capacitor and switching circuit means for initiating the charging and discharging of said capacitor to form the opposing compensating signal;

means for combining said temperature signal and said compensating signal to provide a compensated output signal in which said overtemperature transient is reduced;

means for displaying temperature readout including an overtemperature warning; and

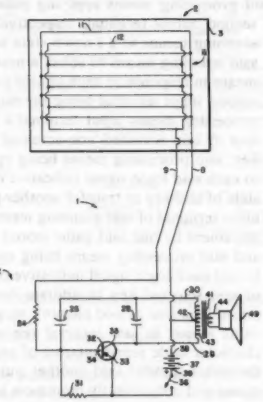
means for applying said compensated output signal to said displaying means so that said overtemperature transient does not produce an overtemperature warning under normal operating conditions, but an abnormally high transient overtemperature condition will still produce an overtemperature warning.

4,502,044

MOISTURE ALARM SYSTEM

James R. Farris, and James R. Farris, Jr., both of 225 W. Winter Ave., New Castle, Pa. 16105

Filed May 19, 1982, Ser. No. 379,619
Int. Cl.³ G08B *21/00*; G01W *1/14*
U.S. Cl. 340—604 **2 Claims**



1. A moisture alarm system comprising:

(a) a grid having at least two conductors, said conductors being provided with a plurality of interjacently spaced extensions connected to said conductors, said grid further providing an impedance between said conductors which decreases in the presence of moisture;

(b) an absorbent flexible sheet to which said grid is secured;

(c) a regenerative oscillator circuit coupled to said conductors of said grid, said oscillator circuit being responsive to said decrease in said impedance between said conductors such that said oscillator circuit commences to oscillate at a predetermined audio frequency when said impedance decreases to a predetermined value, said oscillator including an LC tank circuit, said LC tank circuit including a first capacitor and a coil connected across said first capacitor, said coil also being a primary winding of an audio frequency transformer, said primary winding having a center tap connected to one of said conductors of said grid, said oscillator circuit further having emitter, base and collector electrodes, said emitter electrode being connected to a ground potential within said oscillator circuit, said base electrode being serially connected through resistance means to said other conductor of said grid;

(d) a transducer for converting oscillations of said oscillating circuit to an audible sound, said transducer being coupled to a secondary winding of said transformer;

(e) a second capacitor connected in circuit with said collector electrode, said LC tank circuit, and said base electrode for feeding back a portion of said oscillators of said circuit to said base electrode;

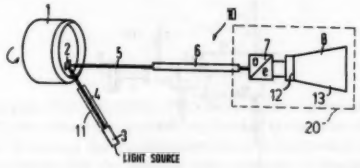
(f) a direct current power source connected in circuit with said emitter electrode and said center tap of said LC tank circuit; and

(g) switching means serially connected in circuit with said power source for interrupting a flow of current from said power source.

4,502,045
OPTICAL DEVICE FOR MONITORING CRITICAL SPEEDS OF A ROTATING MEMBER

Ingrid Fromm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 181,694, Aug. 27, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,572
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936908
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—671 14 Claims



1. An optical device for monitoring critical speeds of a rotating member having a periphery, said device including at least one reflector being arranged on a surface of the rotating member near the periphery of the member to rotate in a circular path, means for directing an input light beam along a path toward a point on the circular path of the reflector to create a reflected beam pulse on a reflected beam path each time the input beam is reflected by the reflector, a light waveguide being arranged on the reflected beam path at an interval from the circular path to receive the reflected beam pulses from said reflector, an opto-electrical transducer being connected to said light waveguide to receive the reflected beam pulses and to convert the beam pulses into electrical pulses, and sound means for generating an alarm being directly connected to an electrical output of said transducer, said sound means comprising a piezoceramic plate with a resonator, said resonator having a natural resonance which is matched to a given pulse frequency of the reflected beam pulses when the rotating member is at said critical speed, said sound means generating an alarm in response to said given pulse frequency of electrical pulses from the transducer so that at normal speeds for the rotating member the electrical pulses applied to the sound means do not create an alarm signal, but at critical speeds the frequency of the electrical pulses is matched to the given pulse frequency and the sound means emits an alarm.

4,502,046
SYSTEM FOR MONITORING METAL-TO-METAL CONTACT IN ROTATING MACHINERY

James W. Wonn, Hempfield Township, Westmoreland County, and Robert L. Osborne, Wallingford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

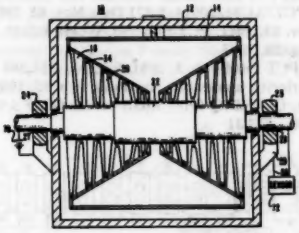
Filed Jun. 1, 1982, Ser. No. 383,400
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—682 14 Claims

1. Apparatus for detecting rubs in rotating machinery, comprising

(A) a stationary machine assembly;

(B) a rotating assembly, rotatable relative to said stationary assembly;

(C) electrical means continuously connecting said stationary and rotating assemblies for establishing an electric current discharge path between them, and

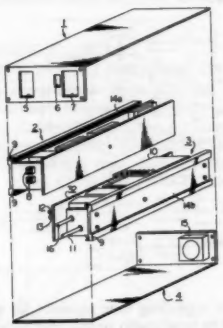


(D) means for detecting deviations of the current in said discharge path with respect to a pre-established normal.

4,502,047
ELECTRONIC PARTS-MOUNTING DEVICE WITH EASY ASSEMBLY AND MAINTENANCE

Kaisaku Fujiwara, Kanagawa; Shigenori Yokooji, and Yasuji Morishita, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,690
Claims priority, application Japan, Nov. 19, 1980, 55-161992
Int. Cl.[3] G08B *23/00, 17/00*
U.S. Cl. 340—693 9 Claims

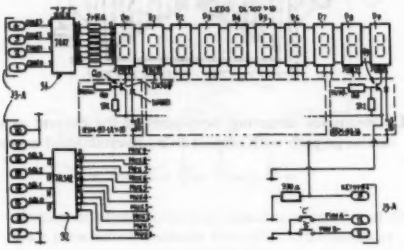


1. An electronic device including a plurality of electric parts, first and second plate-like substrates each mounting on one face a portion of said electric parts and positioned so that said faces oppose each other, a first cover plate having a first side connected to a first side of said first substrate and a second side (opposed to said first side) connected to a first side of said second substrate, and a second cover plate having a first side connected to a second side of the first substrate (opposed to said first substrate first side) and a second side (opposed to said second plate first side) connected to a second side of the second substrate (opposed to said second substrate first side).

4,502,048
SECURITY MEANS

Werner J. Rehm, 22 Lomatta St., The Gap, Queensland, 4061, Australia

PCT No. PCT/AU81/00014, § 371 Date Nov. 13, 1981, § 102(e) Date Nov. 13, 1981, PCT Pub. No. WO81/02349, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 5, 1981, Ser. No. 324,388
Claims priority, application Australia, Feb. 15, 1980, PE2391
Int. Cl.³ H04Q 9/00; E05B 49/00; G06F 3/02
U.S. Cl. 340—825.31 12 Claims

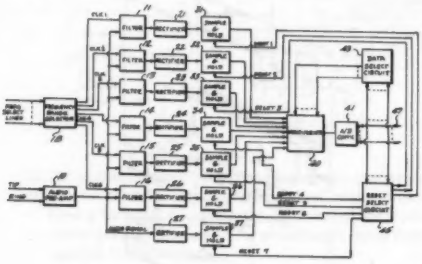


1. Security apparatus comprising:
a keyboard having an array of selectively actuable keys;
a key value designation means for designating a value for each of the keys, said designation means including means for randomly scrambling the designated value of said keys;
a key value display means for displaying the designated values of the keys when said values are designated;
register means, operable for each key actuation, to register the designated value of a key at the time of its actuation.

4,502,049
UNIVERSAL SIGNALLING TONE RECEIVER

Roger F. Atkinson, Huntsville, Ala., assignor to Itec, Inc., Huntsville, Ala.

Filed Aug. 30, 1982, Ser. No. 413,142
Int. Cl.³ H04Q 9/14
U.S. Cl. 340—825.73 12 Claims

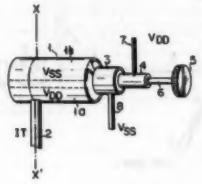


1. A universal signalling tone receiver for separating signal tones from a wide band audio signal, said receiver comprising:
clock generator means for providing a plurality of clock signals having selectively adjustable frequencies;
a plurality of switched component filter means, one for each of said clock signals, each receiving said wide band audio signal and a respective clock signal and passing only components of said wide band audio signal which reside in a narrow pass band centered about a sub-multiple of the frequency of the received clock signal;
a plurality of rectifier means, one for each filter means, each for rectifying signal components passed by a respective filter means; and
a plurality of resettable sample and hold circuits, one for each rectifier means, each for sampling and storing, until reset, rectified signal components from a respective rectifier means.

4,502,050
POSITION DISCRIMINATION DEVICE FOR A THUMB WHEEL SWITCH

Toshio Hibi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 12, 1982, Ser. No. 367,768
Claims priority, application Japan, Apr. 24, 1981, 56-62227
Int. Cl.³ G08C 9/00
U.S. Cl. 340—870.01 7 Claims



1. A voltage level discrimination device for a thumb wheel switch comprising:
a rotatable cylindrical member having on its outer circumference a power source part, a grounding part and an insulating part;
a conductive terminal successively contacting with said power source part, said grounding part and said insulating part as said rotatable cylindrical member rotates in a first direction, and successively contacts said power source part, said insulating part and said grounding part as said rotatable cylindrical member rotates in a second direction;
register means electrically connected to said conductive terminal for storing data;
means for inverting data received from said register means, said inverting means having an input coupled to said register means, and said inverting means having an output coupled to said conductive terminal; and
means for generating signals indicating the state of said thumb wheel switch, said generating means being electrically connected to said register means, said inverting means and said conductive terminal to receive data from said register means and inverted data from said inverting means and from said conductive terminal corresponding to the state of the switch to supply data to said register means, and to generate a state signal indicating the state of said thumb wheel switch.

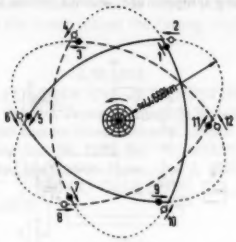
4,502,051
TELECOMMUNICATION SYSTEM WITH SATELLITES POSITIONED IN GEOSTATIONARY POSITIONAL LOOPS

Peter Dondl, Rossdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 347,697
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107762; Nov. 13, 1981, 3145207
Int. Cl.³ H04B 7/19
U.S. Cl. 343—356 9 Claims

1. A telecommunications satellite system with geostationary positional loops consisting of a plurality of satellites which orbit on circular or elliptical paths inclined relative to the equatorial plane, wherein relative to a fixed earth station, said plurality of satellites move on the same apparent path with preferably chronologically identical spacings and wherein their apparent paths form intersect loops or, respectively,

contacts at equal intervals around the sphere (FIG. 1/FIG. 3), and the points of intersection or, respectively, of contact (KP) of the apparent path are simultaneously traversed by two respective satellites 1 and 2 with one on each of the two orbit branches, and at the time of the smallest spacing of an associ-



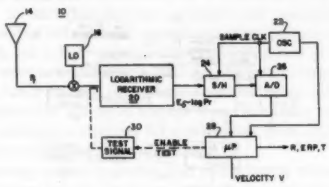
ated pair of said plurality of satellites relative to one another (in KP), the telecommunication pay-load of the satellite (for example, 1) leaving the geostationary loop is inactivated by a control center and the satellite (for example, 2) simultaneously entering the geostationary loop is activated (FIGS. 1 and 2/FIGS. 3 and 4).

4,502,052

PASSIVE DATA ACQUISITION AND ANALYSIS SYSTEM FOR MICROWAVE

George V. Colby, Jr., Lexington, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Jan. 24, 1983, Ser. No. 460,458
Int. Cl.³ G01S 3/02
U.S. Cl. 343—458 8 Claims



1. A passive data determination system for use in a traveling projectile comprising:

means for providing a signal V representing the relative velocity of said projectile to a target;

means defining a logarithmic receiver for receiving a power signal P_r from a source target and emitting in response thereto an output voltage signal E_o which is proportional to the logarithm of P_r;

means for providing a clock pulse signal to measure a change in time, Δt, required to produce a change in output voltage ΔE_o; and

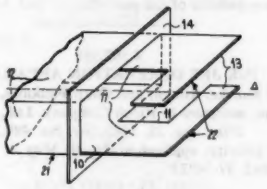
microprocessor means coupled to said logarithmic receiver to produce a signal proportional to ΔE_o, to said clock means to produce a signal proportional to Δt, and to said velocity means to receive the signal V, all for providing a signal R which is a function of $(KV\Delta t)/(\Delta E_o)$, where K is equal to -2 (log e), and where R indicates the range of said projectile to said target.

4,502,053

CIRCULARLY POLARIZED ELECTROMAGNETIC-WAVE RADIATOR

Albert Dupressoir, and Francois Salvat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 10, 1982, Ser. No. 376,718
Claims priority, application France, May 15, 1981, 81 09760
Int. Cl.³ H01Q 1/36, 1/38
U.S. Cl. 343—727 6 Claims



1. A radiator of circularly polarized electromagnetic waves, comprising:

a first source of linearly polarized electromagnetic waves constituted by a waveguide having a radiation aperture;

a second source of linearly polarized electromagnetic waves with a direction of polarization perpendicular to that of said first source, said second source being constituted by a dipole with oppositely pointing metallic stems joined to said waveguide at opposite points of the periphery of said aperture by way of respective feed lines of a length corresponding to a fraction of a wavelength at a midfrequency of an operating band supplied to said waveguide, said stems lying in planes which symmetrically parallel the waveguide axis and are perpendicular to the direction of polarization of the waves radiated by said waveguide; and

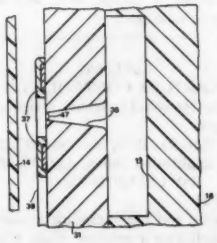
a flat metallic reflector surrounding said waveguide around the periphery of said aperture in conductive contact with said waveguide and with said feed lines for making the phase center of said dipole coincide with that of said waveguide at said aperture, said feed lines being dimensioned to match the impedances of said dipole and said waveguide and to establish phase quadrature between the waves respectively emitted thereby.

4,502,054

SELECTIVE INK-JET PRINTING DEVICE

Riccardo Brescia, Ivrea; Mario Buat, Carema; Giandomenico Dagna, and Alessandro Scardovi, both of Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 28, 1982, Ser. No. 392,664
Claims priority, application Italy, Jul. 10, 1981, 67959 A/81
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 37 Claims



6. Selective ink-jet dot printing device, in which printing of a dot is carried out by selectively inducing an emission of particles of an electrically conductive liquid ink through a

nozzle from an insulting container, wherein the ink is kept under such a pressure such as to form a concave meniscus in the nozzle, said nozzle having an exit diameter of between 20 to 100 micron and a length of at least six times said diameter and the printing of a dot is carried out by a voltage pulse between a first electrode which is in contact with the ink in the container and a second electrode which is disposed outside the nozzle, so as to create excitation of the meniscus and an electric current in the ink in the nozzle such as to create an instantaneous vaporization of a part of ink adjacent said exit, which cause the expulsion of ink particles.

4,502,055

INK JET DEAERATION APPARATUS

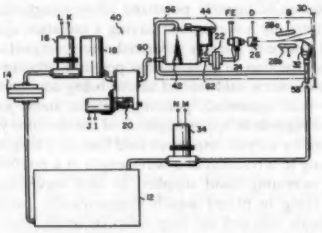
Masanori Horike, Tokyo, and Chuji Ishikawa, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,299

Claims priority, application Japan, May 4, 1982, 57-74821; May 4, 1982, 57-74822

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **14 Claims**



1. An apparatus for removing air from ink which is fed under pressure from an ink pressurizing source to an ink ejection nozzle, comprising:

a first valve disposed in an ink passageway which extends between the ink pressurizing source and the ink ejection nozzle;

a deaerating unit located in an ink passageway between said first valve and the nozzle, said deaerating unit having an ink inlet port communicating to an outlet port of the first valve, an ink outlet port communicating to the nozzle and an air outlet port which is formed in upper part of a bore thereof;

a second valve for selectively opening and closing said air outlet port of the deaerating unit; and

control means for maintaining the first valve open and the second valve closed during ink ejection printing operation of the apparatus;

the control means closing and maintaining the first valve closed and opening the second valve for a predetermined length of time to terminate the ink ejection printing operation and allow air to escape from said deaerating unit through the air outlet port.

4,502,056

TEMPERATURE CONTROL SYSTEM

Yasuhiko Matsuda, Hanamaki, Japan, assignor to Kabushiki Kaisha Sato, Japan

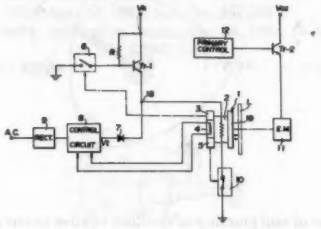
Filed Apr. 21, 1983, Ser. No. 487,256

Claims priority, application Japan, Apr. 30, 1982, 57-71535

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—76 PH **4 Claims**

1. A thermal printer and a temperature control system therefor; said printer including a printing plate, a heater for said plate and means for moving said plate against a heat transfer printing medium; said control system including a relatively high voltage, a control circuit for producing a relatively low voltage related to an input to said control circuit, first means for applying said high voltage to said heater during an initial heating period to rapidly raise the temperature of said plate, first sensor means operatively connected to said first means for interrupting application of said high voltage to said heater when said first sensor means detects that temperature of said plate has reached a predetermined first temperature close to an optimal printing temperature, second means for applying said



low voltage to said heater following said initial period, second sensor means for supplying said input to said control circuit in response to temperature of said plate detected by said second sensor means; said control circuit regulating said low voltage to raise the temperature of said plate to said optimal printing temperature and then maintaining temperature of said plate essentially at said optimal printing temperature.

4,502,057

METHOD AND APPARATUS FOR DETECTING ERRORS IN AN INK RIBBON IN A THERMAL TRANSFER TYPE MULTICOLOR PRINTER

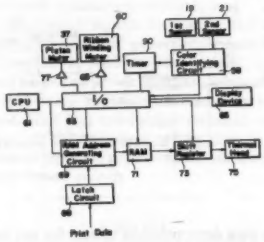
Junji Kawano, and Fumio Takahashi, both of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,874

Claims priority, application Japan, Aug. 30, 1982, 57-151086

Int. Cl.³ B41J *3/20*

U.S. Cl. 346—76 PH **3 Claims**



1. A method of detecting an error such as a cutoff or the like of an ink ribbon used in a thermal transfer type multicolor printer, wherein the ink ribbon is provided with sets of ink zones containing heat dissolving inks, each set of the ink zones including ink zones, disposed in a predetermined order, of different colors, comprising the steps of:

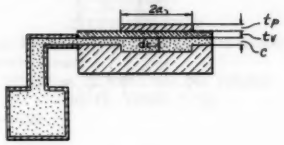
(a) presetting a timer for providing an electric signal representative of detection of the error at an end of a predetermined timing interval equal to a time period necessary in an ink detection mode, in which one of the ink zones having a specified color is detected, for passing at least one ink zone through a printing position where a multicolor printing is made by means of a thermal head;

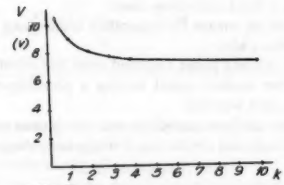
(b) winding the ink ribbon at a predetermined speed in the ink detection mode;

(c) setting the timer at the winding of the ink ribbon;

(d) then, detecting a sensor mark, provided each of the ink zones for indicating its color, and thereby providing a color signal representative of the color indicated by the sensor mark;
(e) resetting the timer according to the color signal; and
(f) providing the error detection signal at the end of the predetermined timing interval when no color signal is supplied to the timer within the timing interval.

4,502,058
LOW VOLTAGE INK-JET PRINTHEAD
Haruhiko Koto, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kabushiki Kaisha Suwa Seikosha, Japan
Filed Jun. 30, 1982, Ser. No. 393,971
Claims priority, application Japan, Jul. 2, 1981, 56-104287
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **13 Claims**





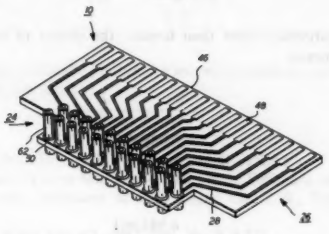
1. In an ink-jet printer head including a piezoelectric element having an electrical capacitance cp, a pressurization chamber coupled to said piezoelectric element for containing ink therein, and an ink ejection passage including a nozzle of cross-section A and a flow passage interconnecting said pressurization chamber and said nozzle, said ink ejection passage having fluid inertance m_3, said piezoelectric element being deformable upon application of a drive voltage V to change the volume of said pressurization chamber for ejecting ink from said nozzle, the improvement therein comprising:
a vibratory system including said piezoelectric element, said vibratory system having an acoustic capacitance Co;
a flow passage system including said ink ejection passage, said pressurization chamber and an ink supply passage for providing ink to said pressurization chamber, the physical and electrical interrelationships in said ink-jet printer head being represented by the equation

$$V = \sqrt{\frac{2\psi^2 Co}{K^2 cp}}$$

$$\text{where } \psi = \frac{VmAm_3C\sqrt{E^2 + D^2}}{Co\exp[-D \cdot \arctan(E/D)/E]}$$

and ψ is the pressure imposed by the piezoelectric element, K is a proportional constant, Vm is the desired ejection speed of ink from said nozzle, C is the acoustic capacitance taking into account compressibility in the pressure chamber, D is a damping coefficient, and E is angular frequency, said acoustic capacitance Co being selected to bring said driving voltage V nearly to a minimum.

4,502,059
ELECTRICAL INTERCONNECTION SYSTEM
Daniel R. Blessington, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 20, 1982, Ser. No. 409,803
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **8 Claims**

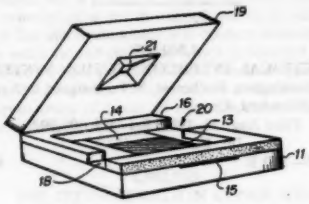


1. An ink jet printing machine of the type having at least one nozzle for projecting a flow of ink droplets therefrom, wherein the improvement includes:
a transducer in communication with said nozzle, said transducer having at least two electrically conductive regions electrically insulated from one another;
a planar member having at least one aperture extending therethrough, said planar member having at least two spaced opposing planar surfaces with at least one conductive element on each opposing planar surface electrically insulated from the other;
said transducer being mounted through said aperture of said planar member, and having one of said conductive regions thereof electrically connected with one of said conductive elements of said planar member, and the other of said conductive regions thereof electrically connected with the other of said conductive elements of said planar member so as to provide a separate electrical connection from both said conductive elements on said opposing surfaces of said planar member to each of said two conductive regions of said transducer; and
means, in electrical communication with both said conductive elements of said planar member, for generating an electrical signal which excites said transducer to eject a droplet of ink from said nozzle.

4,502,060
BARRIERS FOR THERMAL INK JET PRINTERS
Glenn H. Rankin, Menlo Park, and Harold W. Levie, Livermore, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 2, 1983, Ser. No. 490,683
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **6 Claims**

1. An ink jet print head comprising:
a substrate;
an orifice plate having a surface spaced apart from said substrate for containing ink therebetween and having an orifice therein for ejecting ink;
heating means located on said substrate for producing bubbles in said ink; and
barrier means, between said substrate and said surface, for

partially surrounding said heating means for directing the flow of ink to said heating means in a generally circular



direction other than toward the center of said heating means.

4,502,061

IMAGE FORMING APPARATUS

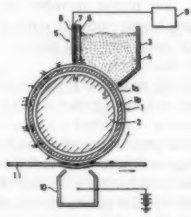
Yujiro Ando, and Haruo Fujii, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,468

Claims priority, application Japan, Sep. 22, 1981, 56-149740; Dec. 15, 1981, 56-203340; May 19, 1982, 57-84169

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **11 Claims**



1. Apparatus for forming images using particulate developer containing a magnetic component, comprising:

a container for accumulating the particulate developer containing a magnetic component;

image holding means disposed to pass said container while contacting the developer in said container;

gate means having a number of electrodes arranged in the direction of the record width and electrically isolated from each other, said gate means having a magnetic property and being provided at an outlet side of said container;

magnetic force generating means disposed at a position opposed to said gate means such that image holding means passes therebetween; and

means for applying a signal voltage to said electrodes of said gate means to correspond to information to be recorded;

wherein during non-recording the outflow of the developer from said container is blocked by the magnetic field formed between said gate means and said magnetic force generating means and during recording said signal voltage is applied to the electrodes of said gate means to adhere the developer to said image holding means and form a record image corresponding to the information to be recorded by enabling the developer to move out from said container against the magnetic field.

4,502,062

APPARATUS FOR RECORDING DATA ON A RECORDING CARRIER

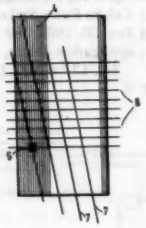
Hermann Künst, Berlin, Fed. Rep. of Germany, assignor to Technomed Elektromed.Apparatebau GmbH and Ingenieurburo Dipl.-Ing. Hermann Kunst, both of, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,393

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3143135

Int. Cl.³ G01D *15/08*

U.S. Cl. 346—155 **25 Claims**



1. An apparatus for recording data on a recording carrier comprising:

a plurality of juxtaposed, insulated recording electrodes forming a fixed recording comb;

selection circuit means for separately controlling each individual electrode;

a grid-like contact panel disposed over the recording electrodes, the contact panel having a plurality of contact surfaces; and wherein

each contact surface extending over more than one recording electrode and contacting a single recording electrode.

4,502,063

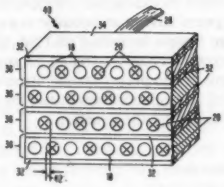
ELECTRODE CONFIGURATION FOR THE PRINT HEAD OF AN ELECTROLYTIC PRINTER

Michael Acciai, Newark Valley; Charles R. Pigos, Endicott, both of N.Y., and Charles G. Speicher, Brackney, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,511

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—155 **4 Claims**



1. Print head apparatus for an electrolytic printer wherein printing is effected by applying electrical pulses of appropriate duration and amplitude supplied by control means therefor to a recording medium to thereby cause any electrolytically involved leuco dye on the upper surface of the recording medium to be shifted into its visible range, said apparatus comprising:

(a) a block of insulating material;

(b) a first plurality of electrodes, secured in said insulating block at a predetermined distance from each other, perma-

nently connected to said control means for actuation thereby only as anodes;

(c) a second plurality of electrodes, secured in said insulating block at a predetermined distance from each other and from said first plurality of electrodes and positioned between adjacent ones of said first plurality of electrodes so that no two of said first plurality of electrodes are horizontally adjacent with respect to the normal orientation of said insulating block, said second plurality of electrodes being permanently connected to an electrical drain to serve only as cathodes; and

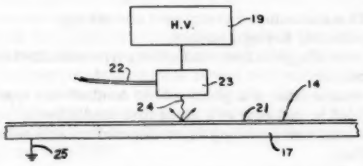
(d) at least one plane of conductive material, one for each pair of interspersed rows of said first and second electrodes used in said print head, said plane being formed in said insulating block between said rows of electrodes, said plane being connected to said electrical drain to also serve as a cathode.

4,502,064

PAGE PRINTER

Ben A. Shapir, Ramat-Gan, Israel, assignor to Avmat Computers Ltd., Tel-Aviv, Israel

Filed Sep. 22, 1983, Ser. No. 534,662
Int. Cl.³ G03G *15/00*
U.S. Cl. 346—160 **9 Claims**



1. A page printer for selectively printing on a paper, said page printer comprising:

means for selectively charging said paper,

said selective charging means comprising means for selectively applying radiant energy to selected portions of said paper to cause electrons to be removed from the normal bond,

means for generally applying a high voltage field proximate to said paper to prevent the removed electrons from returning to said paper, thereby charging said paper,

means responsive to said selective charges for applying toner, and

means for fixing said toner to obtain the desired printout.

4,502,065

TRANSFER TYPE HEAT-SENSITIVE RECORDING MEDIUM

Haruhiko Moriguchi; Yoshiki Kikuchi, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

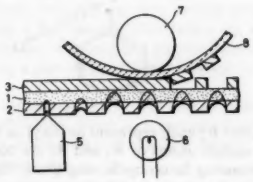
Filed Feb. 10, 1983, Ser. No. 465,373
Claims priority, application Japan, Feb. 10, 1982, 57/18788
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—204 **10 Claims**

8. A method of obtaining an image from an electronic signal comprising the steps of:

moving a transfer type of heat-sensitive recording medium having a porous base impregnated with a colorless color former, a layer of thermally melting ink on one side of said porous base and a layer of thermally melting wax containing a color developer formed on an opposite side of said porous base in proximity to a thermal head receiving an input electronic signal with said wax layer confronting said thermal head;

selectively heating and melting said wax layer in accordance with said input signal wherein said wax permeates said porous base to allow the color developer to color on reaction with said colorless color former;

further heating said wax layer to melt said ink in correspondence with said coloring; and



transferring said molten ink onto a recording sheet in contact with said ink layer.

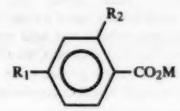
4,502,066

HEAT-SENSITIVE RECORDING SHEET

Toshimi Satake; Kazuo Maruyama, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

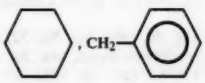
Filed Aug. 17, 1983, Ser. No. 524,521
Claims priority, application Japan, Aug. 30, 1982, 57/149241
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—209 **10 Claims**

1. Heat-sensitive recording sheet having a color forming layer comprising a colorless basic dyestuff and a monophenolic 4-hydroxyphenyl compound, wherein said color-forming layer contains a metal salt of p-alkylbenzoic acid having a general formula (I) or a metal salt of o-benzoylbenzoic acid having the general formula (I)



(I)

(where R_1 represents H, CH_3, C_2H_5, C_3H_7, iso-C_3H_7, tert-C_4H_9, C_5H_{11},



or C_6H_5, providing that R_2 represents CO—C_6H_5 in the case of R_1 is H, or R_2 represents H in other cases, and M represents a polyvalent metal).

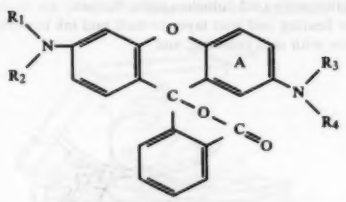
4,502,067

HEAT-SENSITIVE BLACK RECORDING MATERIAL

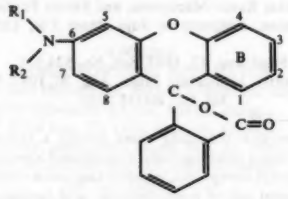
Masanori Matsuda, Sakai; Haruo Koyama, Hirakata, and Nobuhiro Miyakawa, Abiko, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jun. 29, 1983, Ser. No. 509,068
Claims priority, application Japan, Jun. 30, 1982, 57-111476
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—214 **15 Claims**

1. A heat-sensitive recording material capable of forming an image of a hue close to a pure black at a low density, which comprises a dispersion of a leuco dye, a heat-fusible organic acidic substance solid at normal temperature and a sensitizing agent in a binder, wherein the leuco dye comprises a fluoran type leuco dye for forming a black color, which is a compound represented by the following general formula:



wherein R_1 and R_2 each represent an alkyl or aryl group having up to 4 carbon atoms or R_1 and R_2 are bonded to form a nitrogen-containing heterocyclic ring group together with the nitrogen atom, R_3 represents a hydrogen atom or a lower alkyl or aralkyl group, R_4 represents an unsubstituted or substituted aryl group, and the ring A may be substituted with a halogen atom or an alkyl group, and a benzofluoran type leuco dye for forming a red dye, which is a compound represented by the following general formula:



wherein R_1 and R_2 each represent an alkyl group having up to 4 carbon atoms or an aryl group and are bonded to form a nitrogen-containing heterocyclic group together with the nitrogen atom, and the ring B may have a ring fused thereto to form a naphthalene ring as a whole and said naphthalene ring may be substituted with a hydroxyl group, an alkoxy group, an amino group or a substituted amino group, in an amount of 0.01 to 1% by weight based on said black color-forming leuco dye.

4,502,068

THERMOSENSITIVE RECORDING MATERIAL

Keishi Taniguchi, Shizuoka, and Kiyotaka Iiyama, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

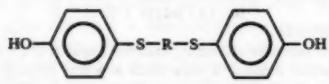
Filed Aug. 30, 1983, Ser. No. 527,899

Claims priority, application Japan, Sep. 20, 1982, 57-163650; Oct. 12, 1982, 57-178882; Oct. 20, 1982, 57-184141; Nov. 1, 1982, 57-192036

Int. Cl.³ B41M *5/18, 5/22*

U.S. Cl. 346—216 **6 Claims**

1. In a thermosensitive recording material comprising a colorless or light-colored coloring material, a color developer capable of inducing color formation in said colorless or light-colored coloring material upon application of heat thereto, support means for supporting said coloring material and said color developer so that said color formation can be induced, the improvement wherein said color developer is a phenolic material of the formula



wherein R is selected from the group consisting of an alkylene group having 1 to 10 carbon atoms; an alkylene group having 1 to 8 carbon atoms and containing 1 to 3 carbonyl groups which are not directly bonded to S in the formula; and an alkylene group having 2 to 15 carbon atoms and containing 1 to 5 ether bonds.

4,502,069

CONTACT FOR AN MIS-SEMICONDUCTOR COMPONENT AND METHOD FOR MANUFACTURING THE SAME

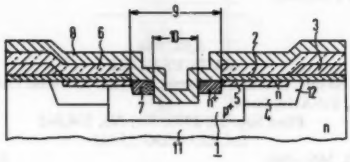
Gottfried Schuh, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,367

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016749

Int. Cl.³ H01L *29/78, 29/06, 23/48, 29/44*

U.S. Cl. 357—23.4 **4 Claims**



1. MIS-semiconductor component comprising:
(a) a substrate having a surface;
(b) a zone of a given first conductivity type embedded in said substrate;
(c) a source zone of a given second conductivity type embedded in said zone of a given first conductivity;
(d) at least one insulating layer disposed on said substrate surface;
(e) an ohmic contact;
(f) an auxiliary zone surrounding at least part of said contact, being of said second conductivity type, being embedded in said zone of first conductivity and more heavily doped than said source zone;
(g) said at least one insulating layer and said auxiliary zone having a hole formed therein;
(h) said contact being connected to said zone of first conductivity through said hole of said auxiliary zone;
(i) said contact being electrically connected to said source zone through said auxiliary zone; and
(j) a channel zone of a first conductivity type disposed between said substrate and said source zone.

4,502,070

FET CONTROLLED THYRISTOR

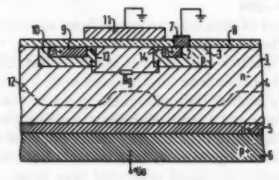
Ludwig Leipold; Jens P. Stengl, and Jenö Tihanyi, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,196

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3024015

Int. Cl.³ H01L *29/74, 27/02, 29/78*

U.S. Cl. 357—38 **6 Claims**



1. Controlled semiconductor switch with a semiconductor

body containing a thyristor structure having a first zone of first conductivity type, free of external connection, embedded in coplanar relationship in a second zone of second conductivity type, free of external connection;

also containing a third zone of the first conductivity type and a fourth zone of the second conductivity type; and further containing an MIS-FET integrated into the semiconductor body and having a source zone of the first conductivity type embedded in coplanar relationship in a zone of the second conductivity type;

an insulating layer disposed on the surface of the semiconductor body, a control electrode lying on the insulating layer and covering a first channel zone operatively associated with the FET; and a cathode electrode on the semiconductor body, comprising the features that:

(a) the zone of the second conductivity type of the MIS-FET constitutes a fifth zone of the semiconductor body and is embedded in the third zone in coplanar relationship therewith and forms the first channel zone at the surface of the semiconductor body;

(b) the source zone of the first conductivity type of the MIS-FET constitutes a sixth zone of the semiconductor body and is embedded in said fifth zone in coplanar relationship therewith;

(c) the second zone of the thyristor structure is embedded in the third zone in coplanar relationship therewith and forms a second channel zone at the surface of the semiconductor body;

(d) the third zone extends to the surface of the semiconductor body between the two channel zones;

(e) the control electrode also covers said second channel zone and the part of the third zone extending to the surface of the semiconductor body; and

(f) the cathode electrode is in contact with the source zone of the MIS-FET.

4,502,071

FET CONTROLLED THYRISTOR

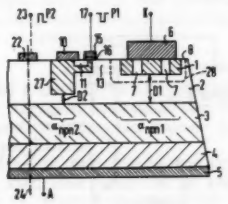
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,061

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112940

Int. Cl.[3] **H01L** *29/74, 29/78, 27/02, 29/167*

U.S. Cl. 357—38 **13 Claims**



1. In a thyristor of the type including a semiconductor body having a boundary surface and including a first emitter of a first conductivity type, a first base of a second, opposite conductivity type carrying said first emitter, a second base of the first conductivity type carrying and forming a pn junction with said first base, a second emitter of the second conductivity type carrying said second base, a pair of emitter electrodes having respective terminals for connection to a load respectively carried on said first and second emitters, and an auxiliary emitter of the first conductivity type for internal current gain located in said first base spaced from said first emitter and extending to said boundary surface and carrying an auxiliary emitter electrode at said boundary surface, the improvement therein comprising:

a semiconductor switch connected between and operable to electrically connect and disconnect said auxiliary emitter electrode and said first base adjacent said auxiliary emitter

wherein:

said first and second bases and said first emitter form a first structure having a first amplification factor α_1; said first and second bases and said auxiliary emitter form a second structure having a second amplification factor α_2;

and

with a blocking voltage applied to said pair of emitter electrodes, the amplification factor α_2 is greater relative to the charge carriers emitted by said auxiliary emitter than the amplification factor α_1.

4,502,072

FET CONTROLLED THYRISTOR

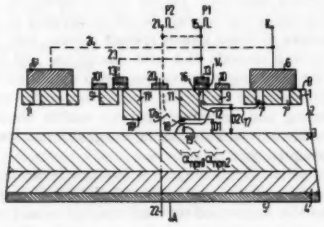
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,925

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112941

Int. Cl.[3] **H01L** *29/74, 29/78, 27/02, 29/167*

U.S. Cl. 357—38 **13 Claims**



1. In a thyristor of the type having a semiconductor body comprising a first base of a first conductivity type contacting a second base of a second conductivity type, a first emitter of the second conductivity type on the first base carrying a first electrode at a boundary surface of the semiconductor body, a second emitter of the first conductivity type carried on the second base, and, for internal current gain, an auxiliary emitter of the second conductivity type spaced laterally from the first emitter and extending from the boundary surface into the first base toward the pn junction of the first and second bases, the auxiliary emitter being a first auxiliary emitter and forming a first semiconductor structure, together with the first and second bases, which has a current transfer ratio α_2, the improvement therein comprising:

a second auxiliary emitter extending into the first base from the boundary surface, spaced from the first auxiliary emitter, and forming a second semiconductor structure, together with the first and second bases, having a current transfer ratio α_1; and

a semiconductor switch operable to selectively connect and disconnect the first and second auxiliary emitters, the current transfer ratio α_1 of the second semiconductor structure, with the application of a blocking voltage to the thyristor, being greater than the current transfer ratio α_2 of the first semiconductor structure in the conductive state of said semi-conductor switch, relative to the charge carriers emitted by said second auxiliary emitter due to the recombination rate of the first auxiliary emitter being significantly greater than that of the second auxiliary emitter because of the greater distance of the first auxiliary emitter to the pn junction of the first and second bases.

4,502,073

NOISE SUPPRESSING INTERFACE CIRCUIT IN A KINESCOPE BIAS CONTROL SYSTEM

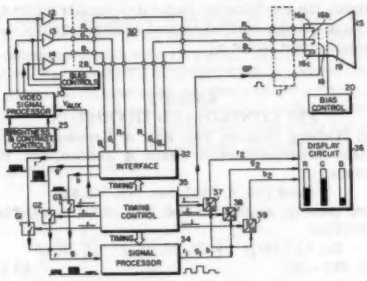
Werner Hinn, Zollikerberg, and Hans-Rudolf Fecht, Berikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,460

Claims priority, application United Kingdom, Apr. 6, 1982, 8210219

Int. Cl.³ H04N *9/62*

U.S. Cl. 358—10 **23 Claims**



14. A service instrument for use with a television receiver including an image reproducing device comprising an electron gun responsive to video signals applied thereto, said electron gun comprising cathode and grid electrodes; and a driver amplifier for providing at an output video signals suitable for driving said cathode electrode; control apparatus operative during sensing and reference intervals within black image intervals when normal video signal image information is suppressed, comprising:

interface means comprising an active device having a first terminal coupled to said output of said driver amplifier, a second low impedance terminal coupled to said cathode, and a third terminal coupled to an output network; said first and second terminals comprising a signal path from said driver amplifier output to said cathode;

bias control signal processing means responsive to signals from said output network for producing a control signal related to the magnitude of black image representative currents conducted by said image display device;

means for biasing said electron gun during said sensing intervals to induce a cathode current representative of the black image current of said image reproducing device, said representative current being applied to said low impedance second terminal of said interface means; and

means responsive to said control signal for indicating the magnitude of said black current; wherein

the signal gain from said first terminal of said interface means to said output network is significantly less than the signal gain from said low impedance second terminal to said output network, so that spurious signals including noise from said output of said driver amplifier are significantly attenuated at said output network to prevent distortion of black current representative signals processed by said bias control signals processing means.

4,502,074

DIGITAL TELEVISION SIGNAL PROCESSING SYSTEM

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

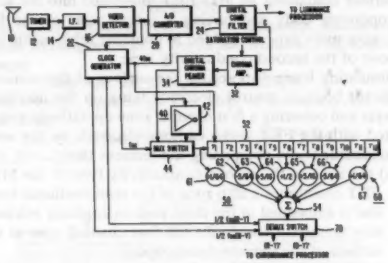
Filed Nov. 9, 1981, Ser. No. 319,459

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—23 **11 Claims**

1. In a television signal receiver, including a source of digital chrominance signals modulated in phase and frequency, apparatus for producing a plurality of filtered and demodulated digital color signals comprising:

means, having an input coupled to said source to receive said digital chrominance signals, and an output, for producing baseband digital color signals of interleaved sampling phases;



a digital filter, having an input coupled to receive said baseband digital color signals, and an output, and exhibiting a response characteristic which is substantially equal to the desired passband of said demodulated digital color signals; and

means, coupled to the output of said digital filter, for producing said plurality of filtered and demodulated digital color signals.

4,502,075

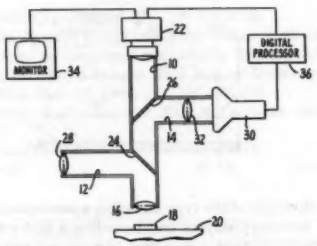
METHOD AND APPARATUS FOR PRODUCING OPTICAL DISPLAYS

Sherman E. De Forest, Encinitas; Gunner Bolz, Solano Beach, and Robert E. La Quey, La Jolla, all of Calif., assignors to International Remote Imaging Systems, Chatsworth, Calif.

Filed Dec. 4, 1981, Ser. No. 327,367

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—93 **14 Claims**



1. A method of creating an optical display which comprises:

producing a representation of a real optical scene;

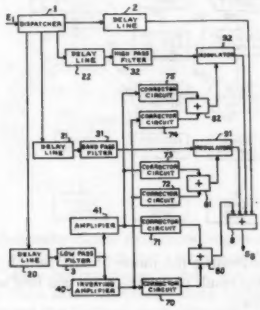
establishing an image transmission path with the path including a stage at which the representation is produced; and

projecting a parameter of the representation onto the real optical scene, whereby a combined optical display is produced comprising the real optical scene combined with a parameter of the representation of the real scene.

4,502,076
SELECTIVE EFFICIENCY VIDEOFREQUENCY NON-LINEARITY CORRECTION DEVICE

Claude Cluniat, and Joseph Delattre, both of Chatou, France, assignors to LGT Laboratoire General des Telecommunications, Chatou, France

Filed Apr. 5, 1982, Ser. No. 365,388
Claims priority, application France, Apr. 14, 1981, 81 07459
Int. Cl.³ H04N 5/38
U.S. Cl. 358—160 7 Claims



1. A selective efficiency video frequency nonlinearity correcting device, for precorrecting nonlinearities introduced in video frequency signals in high frequency stages of television equipment:

a video frequency signal;

a dispatcher, receiving said video frequency signal, said dispatcher having at least two outputs connected respectively to the input of a wide band channel and to the input of a low frequency correction channel;

wherein said correction channel comprises

a low pass filter whose output is coupled to at least one threshold corrector circuit comprising means for selecting threshold ranges of signal levels to be corrected, and associated amplitude adjustment means coupled to said low pass filter for adjusting the amplitude of said low pass filter output, and

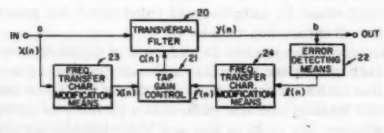
the output of the corrector circuit is coupled to an output of said low frequency correction channel by a summator output circuit; and

the outputs of the wide band channel and the correction channel are connected to two corresponding inputs of said summator output circuit such that combination of said two corresponding inputs forms a precorrected signal.

4,502,077
GHOST CANCELING APPARATUS

Noriaki Morotomi, Neyagawa, and Takeshi Sato, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1981, Ser. No. 316,423
Claims priority, application Japan, Oct. 29, 1980, 55-152917
Int. Cl.³ H04N 5/21; H04B 3/04
U.S. Cl. 358—167 7 Claims



1. A ghost component signal canceling apparatus for canceling a ghost component in a video signal, said apparatus comprising (a) a ghost component signal transferring path which transfers a signal including a ghost component signal and comprises:

an input terminal to which a video signal is inputted;

a transversal filter operatively coupled at an input terminal thereof to said input terminal of said ghost component signal transferring path for canceling said ghost component signal;

an error detecting means operatively coupled at an input terminal thereof to an output terminal of said transversal filter for detecting a ghost component canceling error signal from said video signal; and

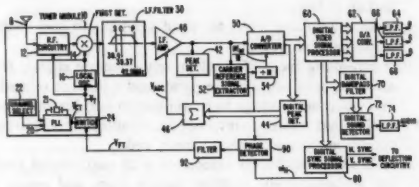
a tap gain control means operatively coupled at an input terminal thereof to an output terminal of said error detecting means for generating a tap gain control signal to said transversal filter from said ghost component canceling error signal, (b) a control signal path for supplying said control signal from said tap gain control means to a tap gain control terminal of said transversal filter, said transversal filter canceling a ghost component signal under the control of said tap gain control signal, and (c) an outputting path for supplying an output signal of said transversal filter to an output terminal of said ghost component signal canceling apparatus, wherein said ghost component signal canceling apparatus further comprises a frequency transfer characteristic modification means provided in said ghost component signal transferring path for amplifying a signal level at a specified frequency range of said signal which is transferred through said ghost component transferring path;

wherein said frequency transfer characteristic modification means is connected between said output terminal of said transversal filter and said input terminal of said error detecting means.

4,502,078
DIGITAL TELEVISION RECEIVERS

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,307
Int. Cl.³ H04N 5/44
U.S. Cl. 358—188 20 Claims



10. In a television signal processing system, including a source of analog television information intermediate frequency signals including an i.f. picture carrier of a given frequency, signal translation apparatus comprising:

intermediate frequency signal processing circuitry, having an input coupled to received said analog television intermediate frequency signals, and including an intermediate frequency filter for shaping an i.f. signal passband of frequencies including said i.f. picture carrier signal, an intermediate frequency amplifier, and an output at which intermediate frequency signals contained within said i.f. signal passband are produced;

means, responsive to said intermediate frequency signals, for producing a sampling signal which is less than twice the frequency of said i.f. picture carrier;

an analog to digital converter, having an input coupled to the output of said intermediate frequency signal processing circuitry, and responsive to said sampling signal for sampling said intermediate frequency signals contained

within said i.f. signal passband to produce digital signal samples representing said television information and contained within a band of frequencies which is lower in frequency than said i.f. signal passband frequencies; and

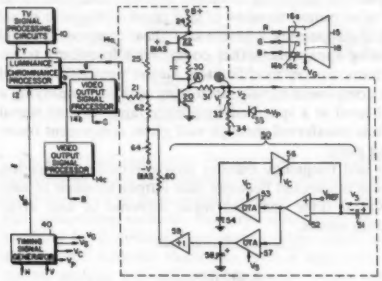
digital signal processing means, responsive to said digital signal samples, for producing processed digital television signals.

4,502,079

SIGNAL SAMPLING NETWORK WITH REDUCED OFFSET ERROR

Paul Filliman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,827
Int. Cl.³ H04N *5/68*
U.S. Cl. 358—243 **19 Claims**



1. Signal processing apparatus operative during a reference interval and a subsequent signal sampling interval, comprising:

a source of reference voltage;

biasing means;

signal utilization means;

a first amplifier with an input coupled to said biasing means, and an output;

a second amplifier with an input coupled to said biasing means, and an output;

first switching means for selectively enabling signals from said output of said first amplifier and a voltage related to said reference voltage to be applied to said biasing means during said reference interval, for establishing a reference condition for said baising means; and

second switching means associated with said second amplifier for selectively enabling signals from said output of said second amplifier to be applied to said signal utilization means during said sampling interval; wherein

said first and second amplifiers produce substantially the same output signal at the end of said reference interval.

4,502,080

OPERATION DEVICE FOR FACSIMILE

Shin Tsuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

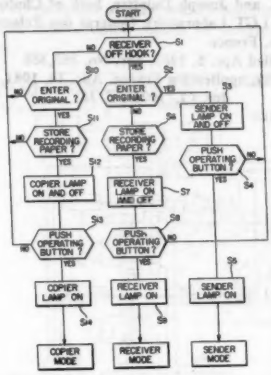
Filed Jul. 19, 1982, Ser. No. 399,287
Claims priority, application Japan, Aug. 7, 1981, 56-122946
Int. Cl.³ H04M *1/00*
U.S. Cl. 358—256 **21 Claims**

1. An operating device for facsimile comprising:

a single switch for causing the operation of the sending and receiving modes of facsimile;

first detecting means for detecting the state of a telephone handset;

second detecting means for detecting the presence or absence of an original document; and



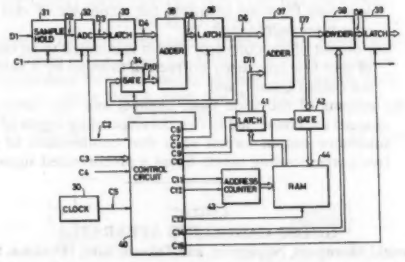
control for controlling the mode of said switch means according to the result of detection by said first and second detecting means.

4,502,081

VARIABLE DENSITY SCANNER

Hirotaka Otsuka, Kawasaki; Hideo Uchida, Tokyo; Yoshihiro Uno, Machisa; Katsuo Nakazato, Tokyo; Kunio Sannomiya, Atsugi; Hidehiko Kawakami, Machida, and Hiroshi Tsuchiya, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Graphic Communications Systems, Inc., both of, Japan

Filed Sep. 29, 1982, Ser. No. 428,235
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—280 **11 Claims**



1. An apparatus for scanning an original at a variable density in response to a control signal, comprising:

first means for scanning a light beam of a fixed spot size on said original along each of a plurality of parallel line paths at a constant speed to generate a video signal and successively shifting the line path to the next;

second means for sampling said video signal and generating therefrom a video sample;

third means responsive to said control signal for dividing each of said line paths into a plurality of line segments so that each segment derives a plurality of said video samples and forming said line paths into a plurality of groups of adjacent line paths so that said video samples are derived from a plurality of patterns of rows and columns; and

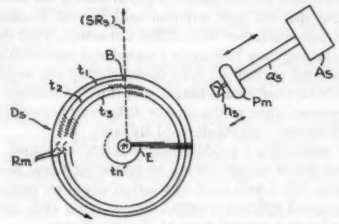
fourth means for arithmetically dividing the total value of the video samples of each pattern by their number in response to said control signal to derive an average value.

4,502,082

SPIRAL RECORDING AND ASSOCIATED SYSTEM

Herbert U. Ragle, and Norman S. Blessum, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 807,155, Jun. 16, 1977,. This application Dec. 18, 1978, Ser. No. 970,578
Int. Cl.³ G11B 5/43
U.S. Cl. 360—76 24 Claims



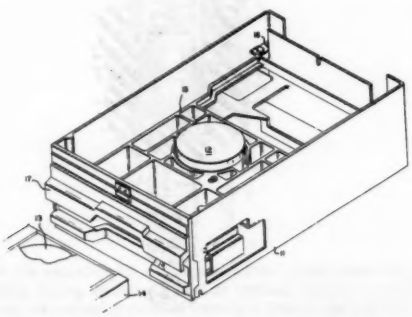
1. A high density digital data recording medium comprised of at least one "spiral" track, each track comprising respective magnetic "skew bit transitions"; these transitions being oriented in a "first skew direction" along certain non-adjacent track-loops and in a "second skew direction" along all "other" track-loops, this second skew direction being orthogonal to the "first", as "sighted" along the reference spiral track direction, so that, as a result, adjacent spiral tracks present skew bits which are transverse to one another and thus minimize "adjacent bit interference" and therefore also minimize, or eliminate, inter-track "guard bands" common with such high density recording.

4,502,083

MAGNETIC DISK DRIVE HAVING A MOVABLE DRIVE MOTOR

Randall C. Bauck, Davis County; S. Peter Kleczkowski, and Anton J. Radman, both of Weber County, all of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed Apr. 22, 1981, Ser. No. 256,594
Int. Cl.³ G11B 5/016
U.S. Cl. 360—99 5 Claims



1. A magnetic disk drive for writing and reading data to and from a magnetic disk contained in a cartridge which is inserted through an opening into said disk drive comprising:

a yoke rotatable about a pivot in said disk drive;

a bezel member mounted on the end of said yoke to normally close said opening and;

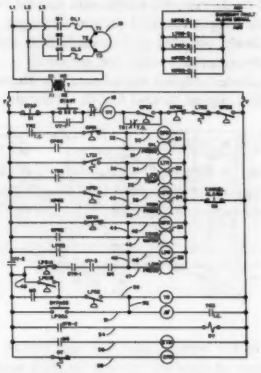
a motor having a spindle for engaging said magnetic disk to rotate it, said motor being mounted on said yoke so that rotation about said pivot moves said bezel member out of said opening and moves said motor spindle out of engagement with said disk and opposite rotation of said yoke moves said bezel member into said opening and moves said motor spindle into engagement with said disk.

4,502,084

AIR CONDITIONING SYSTEM TROUBLE REPORTER

William J. Hannett, Jamesville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 23, 1983, Ser. No. 497,460
Int. Cl.³ H02H 3/04
U.S. Cl. 361—23 3 Claims



1. In a system driven by a motor, apparatus for providing a persistent indication of an impending shutdown when any of a plurality of preselected conditions reach a first level and for shutting off said motor when any one of said preselected conditions reaches a second level comprising:

circuit means for shutting off said motor when any one of said preselected conditions reaches said second level;

a plurality of electrical paths in parallel with said circuit means with each of said plurality of electrical paths being made up of a first and second parallel circuit in series;

each of said first parallel circuits having a first branch containing a first open switch means closable in response to one of said preselected conditions reaching its said first level and a second branch containing a normally open relay operated second switch means;

each of said second parallel circuits having a first branch containing a relay coil means for controlling the second switch means in the corresponding first parallel circuit and a second branch containing indicator means whereby upon any one of said preselected conditions reaching its said first level, the corresponding first switch means closes thereby activating the corresponding relay coil means which in turn closes the corresponding second switch means and activates said indicator means.

4,502,085

POWER AMPLIFIER WITH CONTROLLABLE LOSSLESS SNUBBER CIRCUIT

Heber J. Morrison, Ellicott City, and Lawrence W. Koenig, Linthicum, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1982, Ser. No. 436,866
Int. Cl.³ H02H 7/20
U.S. Cl. 361—56 15 Claims

1. A power amplifier comprising:

a first switch coupled between a first and second terminal;

a second switch coupled between said second and a third terminal;

a third switch coupled between said first and a fourth terminal;

a fourth switch coupled between said fourth and third terminal;

said first terminal adapted for coupling to a positive potential of a power supply;

said third terminal adapted for coupling to a return path of said power supply;

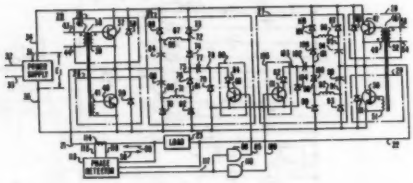
said second and said fourth terminal adapted for coupling across a load;

a first diode coupled across said first switch having its cathode coupled to said first terminal;

a second diode coupled across said second switch having its cathode coupled to said second terminal;

a third diode coupled across said third switch having its cathode coupled to said first terminal;

a fourth diode coupled across said fourth switch having its cathode coupled to said fourth terminal;



first means for turning said first and fourth switches on at first times to conduct current through said load in a first direction and for turning said second and third switches on at second times to conduct current through said load in a second direction opposite said first direction;

a first capacitor having one side coupled to said second terminal and the other side coupled to the anode of a fifth diode, the cathode of said first diode coupled to said first terminal;

first means for charging said first capacitor to a predetermined voltage at times said second switch is conducting;

a second capacitor having one side coupled to said second terminal and the other side coupled to the cathode of a sixth diode, the anode of said second diode coupled to said third terminal;

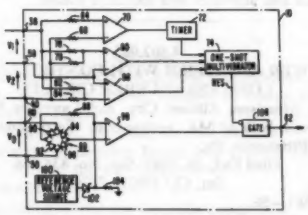
second means for charging said second capacitor to a predetermined voltage at times said first switch is conducting.

4,502,086

DIFFERENTIAL PROTECTIVE RELAY

Toshinobu Ebisaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,577
Claims priority, application Japan, Jul. 1, 1982, 57-115988
Int. Cl.³ H02H *3/28, 7/045*
U.S. Cl. 361—87 **7 Claims**



1. A differential protective relay for detecting a fault in a protected device of an ac electrical power system, and for opening a circuit breaker in response to the fault, said differential protective relay comprising:

means for producing a first current-derived signal representative of the current flowing into the protected device;

means for producing a second current-derived signal representative of the current flowing out of the protected device;

means for producing first, second, and third evaluation signals, wherein said first evaluation signal is representative of said first current-derived signal during the positive half-cycle thereof, and wherein said second evaluation signal is representative of said first current-derived signal during the negative half-cycle thereof and representative of the second current-derived signal during the negative half-cycle thereof, and wherein said third evaluation signal is representative of the phasor difference between said first and second current-derived signals;

means for producing a predetermined reference signal;

comparator means for producing an operating signal having a first state when said third evaluation signal exceeds said predetermined reference signal, and wherein said operating signal is in a second state at all other times;

suppression means for producing a suppression signal having a first state when the absolute values of said first and second evaluation signals are equal, wherein said suppression signal is in said first state for a predetermined duration, and wherein said suppression signal is in a second state at all other times;

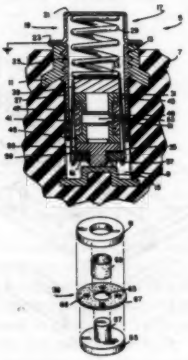
and trip means responsive to said operating and suppression signals for producing a trip signal when said operating signal is in said first state and said suppression signal is in said second state, wherein the circuit breaker is responsive to said trip signal for opening the circuit breaker.

4,502,087

SURGE VOLTAGE ARRESTER ASSEMBLY

Jean-Marie Huvet, Rilly la Montagne, France, assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 433,498, Oct. 8, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,656
Claims priority, application France, Jul. 20, 1982, 82 12067
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—119 **8 Claims**



1. A surge voltage arrester assembly comprising:

a metallic tubular housing member;

an electrically conductive cage positioned within said housing member and having outwardly extending resilient fingers slideably engaging said housing member;

electrically conductive contact means within said electrically conductive cage;

a hermetically sealed cold cathode gas tube with first and second electrodes spaced by an electrical insulator form-

ing a primary arc gap, said cold cathode gas tube being positioned within said cage with said first electrode contacting said electrically conductive contact means;

a first electrically conductive member contacting said second electrode of said cold cathode gas tube within said electrically conductive cage, said first electrically conductive member having an axially extending protuberance;

centrally apertured electrical insulator means having a plurality of circumferentially spaced and isolated holes, said insulator means being telescoped over said axially extending protuberance of said first electrically conductive member and positioned adjacent said first conductive member;

a sleeve of electrical insulating material telescoped over said protuberance of said first electrically conductive member; and

a second electrically conductive member having a central aperture and telescoped over said sleeve of electrical insulating material, said second electrically conductive member being positioned immediately adjacent said electrical insulator means and retained by and contacting said resilient fingers within said electrically conductive cage whereby said circumferentially spaced holes provide secondary arc gaps intermediate said first and second electrically conductive members.

4,502,088

LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

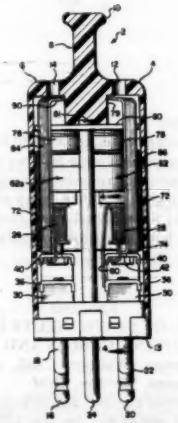
Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Mar. 18, 1983, Ser. No. 476,703

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ H02H 9/06

U.S. Cl. 361—124 **3 Claims**



1. A line protector for a communications circuit comprising a housing having an end wall and an opening opposite to said end wall, an insulating member forming a base and having step surfaces, said base closing said opening, conductive line pins projecting from said base, a first conductive element rigidly secured to one of said line pins and a second conductive element rigidly secured to the other line pin, said conductive elements being respectively supported by the step surfaces and each conductive element and its associated pin being electrically insulated from the other conductive element and its associated pin, a heat coil assembly having telescoping portions rigidly secured together by a fusible substance, a coil of wire surrounding said telescoping portions and having one end of the coil connected to one conductive element and the other end of the coil connected to the other conductive element, thereby to form a protector circuit between the line pins and wherein the coil generates heat to melt the fusible substance upon an overcurrent condition in a communications line circuit in which the protector circuit is a part, one of said telescoping portions being rigidly secured to one of said conductive elements, the conductive elements being between the heat coil and the insulating member, a conductive test terminal in said housing, said test terminal extending between said end wall and one of said conductive elements, said test terminal being resilient and having a normal length that is greater than the distance between said end wall and said one conductive element so that said test terminal is bent within its elastic limits to a condition foreshortened from its normal length to maintain intimate pressure contact with said one conductive element and with said end wall, and said end wall having an aperture at which said test terminal is exposed for receiving a test probe to test said line circuit.

4,502,089

LIGHTNING ARRESTER

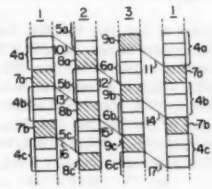
Jun Ozawa; Katuji Shindo, and Shingo Shirakawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,893

Claims priority, application Japan, Apr. 24, 1982, 57-68047

Int. Cl.³ H02H 9/04

U.S. Cl. 361—127 **3 Claims**



1. A lightning arrester comprising a plurality of stacks of resistor units made of a first nonlinear resistance material and spacer units made of a second nonlinear resistance material providing a substantially continuous voltage-current characteristic and having a specific resistance value greater than that of the first nonlinear resistance material of said resistor units, said spacer units being disposed between every two adjacent resistor units in each stack, and means for electrically connecting in series resistor units alternately selected from the respective stacks such that every two adjacent series-connected resistor units are connected in parallel with one of said spacer units.

4,502,090

PROTECTIVE CONTROL SYSTEM FOR ENGINE

Albert H. Sloan, 4200 Kean Rd., Fort Lauderdale, Fla. 33314

Filed Feb. 24, 1983, Ser. No. 469,292

Int. Cl.³ H01H 47/22

U.S. Cl. 361—153 **8 Claims**

1. A control system for controlling energization of a load from a source of electric power in response to a predetermined condition comprising:

a source of electric power;

a load energizable from said source of electric power;

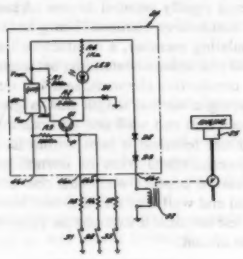
a circuit including a solid state voltage regulating device connected between said source of electric power and said load, said device comprising an adjustment terminal responsive to the magnitude of a bias signal thereon to regulate the power supplied to said load from said source of electric power;

said circuit further including an impedance connected be-

tween said adjustment terminal and said source of electric power;

and switch means responsive to said predetermine condition to control shunting of said impedance to effect the magnitude of said bias signal, said switch means comprising a transistor having its emmitter-collector circuit connected across said impedance,

and further comprising at least one condition responsive switch connected to said base terminal of said transistor.



4,502,091

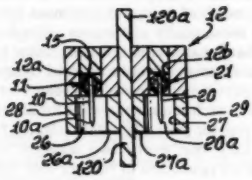
POSITIVE AND NEGATIVE ION DISTRIBUTOR BAR

Donald G. Saurenman, 6787 Worsham Dr., Whittier, Calif. 90602

Continuation-in-part of Ser. No. 420,904, Sep. 21, 1982, which is a continuation-in-part of Ser. No. 369,925, Apr. 19, 1982, which is a continuation-in-part of Ser. No. 290,423, Aug. 6, 1981, Pat. No. 4,390,923, which is a continuation-in-part of Ser. No. 259,503, May 1, 1981, Pat. No. 4,388,667, which is a continuation-in-part of Ser. No. 241,684, Mar. 9, 1981, which is a continuation-in-part of Ser. No. 124,242, Feb. 25, 1980, Pat. No. 4,282,830. This application Feb. 21, 1984, Ser. No. 581,732

Int. Cl.³ H05F *3/06*

U.S. Cl. 361—213 **1 Claim**



1. In apparatus for reducing static electricity on work surfaces, the combination that includes:

(a) first electrical conductor means having first tips spaced therealong in a first longitudinal row to dispense positive ions in response to first voltage application to the first conductor means,

(b) second electrical conductor means having second tips spaced therealong in a second longitudinal row to dispense negative ions in response to second voltage application to the second conductor means, the first and second voltages being different, and

(c) a longitudinally elongated, electrically insulative bar mounting said conductor means at locations and separations from one another characterized in that static electricity at or proximate the work to be treated is effectively reduced to non-objectionable levels when such differential voltages are applied to the conductor means,

(d) the first and second rows being parallel, said tips being in first and second recesses, respectively, defined by the bar,

(e) the first conductor means including a first conductor adapted to have positive voltage applied thereto, and the second conductor means includes a second conductor adapted to have negative voltage applied therebetween, the conductors located within said bar, and being flexible, said bar including first and second bar sections, said first section defining said first recesses and said second section defining said second recesses, said sections consisting of electrically insulative plastic material,

(f) each section defining a chamber receiving one of said conductors adjacent the recesses, each conductor including an electrically conductive core and an insulative sheath thereon, the needles pressed through said cores to sidewardly adhere to the core,

(g) the bar further including a divider plate,

(h) said sections mounted along opposite sides of the divider plate so that the first recesses are staggered relative to the second recesses.

4,502,092

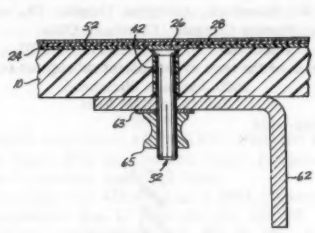
INTEGRAL LIGHTNING PROTECTION SYSTEM FOR COMPOSITE AIRCRAFT SKINS

Engbert T. Bannink, Jr., Auburn, and Glenn O. Olson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 454,206, Sep. 30, 1982. This application Feb. 24, 1983, Ser. No. 469,346

Int. Cl.³ H05F *1/02*

U.S. Cl. 361—218 **6 Claims**



1. In combination:

an integral lightning protection system for an aircraft graphite epoxy structure having a fastener inserted therein;

an electrically conductive substructural member for supporting said aircraft graphite epoxy structure; and,

electrically non-conductive means coupled between said fastener and said electrically conductive substructural member.

4,502,093

CONTROL OF STATIC NEUTRALIZATION EMPLOYING CABLES AND WIRES

Donald G. Saurenman, Whittier, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation-in-part of Ser. No. 369,925, Apr. 19, 1982, which is a continuation-in-part of Ser. No. 290,423, Aug. 6, 1981, Pat. No. 4,390,923, which is a continuation-in-part of Ser. No. 259,503, May 1, 1981, Pat. No. 4,388,667, which is a continuation-in-part of Ser. No. 241,684, Mar. 9, 1981, which is a continuation-in-part of Ser. No. 124,242, Feb. 25, 1980, Pat. No. 4,282,830. This application Sep. 21, 1982, Ser. No. 420,904

Int. Cl.³ H05F *3/06*

U.S. Cl. 361—231 **25 Claims**

1. In apparatus for reducing static electricity in a work zone, the combination that includes:

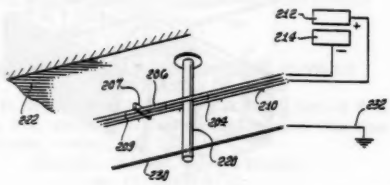
(a) first electrically conductive cable means having tips spaced therealong to dispense positive ions in response to first voltage application to the first cable means,

(b) second electrically conductive cable means having tips spaced therealong to dispense negative ions in response to

second voltage application to the second cable means, said first and second voltages being different, and

(c) spacers carried by the cable means and holding said cable means at locations and separations from one another characterized in that static electricity at or proximate the work to be treated is effectively reduced to non-objectionable levels when said differential voltages are applied to the cable means,

(d) and the spacers spaced apart along the lengths of the cables and said tips located in close association with the spacers,



(e) said tips projecting in generally the same direction and said first and second cable means being flexible between said spacers,

(f) and including auxiliary means spaced from the first and second cable means in the direction of ion flow therefrom toward the work, said auxiliary means being at a selected potential and having exposed electrically conductive surface extent, and control means connected with said auxiliary means to apply a controlled level of voltage thereto.

4,502,094

ELECTROSTATIC CHUCK

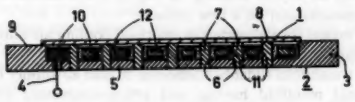
Ian H. Lewin, Forest Row; Michael J. Plummer, Redhill, and Rodney Ward, Crawley, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,723

Claims priority, application United Kingdom, Sep. 14, 1981, 8127638

Int. Cl.³ H01F *13/00*

U.S. Cl. 361—234 **13 Claims**



1. An electrostatic chuck for holding a semiconductor wafer in a fixed plane relative to said chuck, which chuck comprises an electrically conductive member separated from said fixed plane by a layer of dielectric material, means for electrically contacting the wafer, and means for supporting the wafer in said plane, including thermally conductive portions for contacting the wafer, the electrically conductive member comprising parts which extend laterally between said thermally conductive portions, and the dielectric layer extending at least on said parts.

4,502,095

REGENERABLE ELECTRIC LAYER CAPACITOR

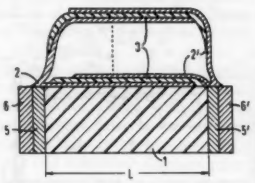
Horst Pachonik, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,892

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231576

Int. Cl.³ H01G *1/017*

U.S. Cl. 361—273 **4 Claims**



1. Regenerable electric layer capacitor, comprising a carrier being formed of insulating material and having two sides, aluminum layers of different polarity and dielectric layers produced by glow polymerization alternatingly disposed on said carrier, said aluminum layers of each polarity being extended beyond said dielectric layers toward a different respective side of said carrier, and said aluminum layers containing substantially 1.5 to 10% by weight of copper for prevention of thermomigration.

4,502,096

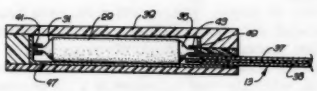
LOW-INDUCTANCE CAPACITOR

Edgar W. Malone, Goleta, Calif., assignor to Reynolds Industries Inc., Los Angeles, Calif.

Filed Aug. 11, 1983, Ser. No. 521,986

Int. Cl.³ H01G *1/13, 7/00*

U.S. Cl. 361—308 **14 Claims**



1. A low-inductance capacitor comprising:

two elongated foil strips of substantially the same width;

two elongated dielectric strips interleaved with the two foil strips and wound to form an oblong spiral roll having flat opposing sides, the two foil strips being spaced a predetermined distance apart from each other for all of the successive windings of the roll;

wherein the two foil strips are offset laterally with respect to each other such that they form oblong spiral-shaped projections defining opposite ends of the roll;

two clamps for independently compressively gripping the two oblong spiral-shaped projections and thereby making electrical contact with them and serving as elongated, flat electrical terminals for the roll;

a foil strip transmission line including two foil conductor strips secured to the opposite sides of a flat insulator strip; and

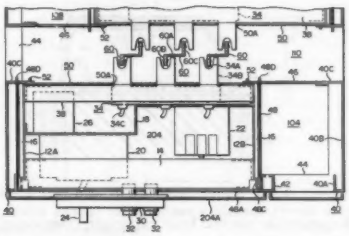
electrical connection means for interconnecting each of the two clamps with a separate foil conductor strip of the transmission line, the electrical connection means extending substantially along the entire lengths of the two clamps.

4,502,097

CONTROL CENTER HAVING CABINET WITH IMPROVED LATERAL STRENGTH AND SAFETY

Masaru Takahashi, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,720
Claims priority, application Japan, Aug. 18, 1981, 56-128877
Int. Cl.³ H02B 1/04
U.S. Cl. 361—342 **3 Claims**



1. A control center comprising:

a cabinet having a vertical bus compartment disposed in the central portion of said cabinet and dividing said cabinet into a front portion and a rear portion, a pair of unit compartments disposed in said front and rear portions respectively, and a vertical wiring compartment disposed beside each of said unit compartments, a plurality of horizontal partition plates spaced vertically from each other in each of said unit compartments for partitioning each of said unit compartments into a plurality of unit rooms vertically superposed one above another, a pair of supporting plates at the rear of each of said unit rooms adjacent said vertical bus compartment and on each of the opposite lateral sides thereof and spaced laterally from each other, and a rear sheet metal plate disposed in the rear of each of said unit rooms and connected between said supporting plates and closing the space between said supporting plates and between adjacent ones of said partition plates, respectively, said rear plate further including at least one opening for allowing a plug-in type connector to extend therethrough;

a plurality of plug-in type control units, each housed in an associated unit room, each plug-in type control unit including spaced opposed lateral plates and a crossarm connected between the upper corners of said lateral plates which, when the unit is housed in a corresponding unit room, is toward said vertical bus compartment, the remainder of the space between the edges of said lateral plates which are toward said vertical bus compartment being open, at least one plug-in type connector on said crossarm, and a mounting plate connected to said lateral plates and having electric equipment mounted thereon, said edges of said lateral plates, when the unit is housed in a corresponding unit room, abutting a corresponding supporting plate and rear plate.

4,502,098

CIRCUIT ASSEMBLY

David F. Brown, 22 Waterpump Ct., Thorplands, Northampton, and Michael J. Anstey, Penhallow, Kiln Ride Extension, Wokingham, Berks, both of England

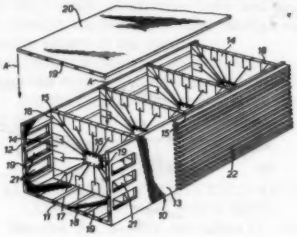
Filed Feb. 8, 1982, Ser. No. 346,539
Claims priority, application United Kingdom, Feb. 10, 1981, 8103954; Nov. 3, 1981, 8133177; Nov. 24, 1981, 8135415; Feb. 1, 1982, 8202829
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **28 Claims**

1. An electrical circuit assembly, comprising;

a plurality of substantially identically-shaped electrical component carrier members each having a predetermined plurality of electrical contacts arranged along its periphery and each being similarly sized and each carrying a respective single electrical component which is electrically connected directly to at least some of the said contacts, and

a mounting structure supporting the said members in predetermined stacked relationship,

the mounting structure including a plurality of conductive



members electrically engaging the contacts on the said carrier members, at least some of the conductive members each making common electrical contact with said contacts on different ones of said carrier members, whereby the mounting structure provides electrical connection between such different ones of said carrier members,

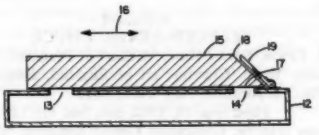
the mounting structure defining openings between said component carrier members to improve cooling and to facilitate testing and interconnection.

4,502,099

PRINTED CIRCUIT CARD AIR COOLING SYSTEM

Kenneth L. Manes, Lafayette, and William D. Hart, Louisville, both of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed May 27, 1983, Ser. No. 497,049
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **10 Claims**



1. An improved air cooling system including cooling articles in a movable enclosure, comprising:

(a) an air supply housing having first and second openings spaced-apart on a first surface;

(b) means for delivering pressurized cooling air into said air supply housing;

(c) a manifold slidably connected to said air supply housing, said manifold having said article-containing enclosure rigidly mounted to a mounting surface thereof, said mounting surface having one opening therein through which cooling air from said manifold may enter said article-containing enclosure, and said manifold further having another opening on a second surface thereof through which cooling air passing through one of said first or second openings of said air supply housing may enter said manifold, said first opening of said air supply housing being positioned so that it is opposite said manifold second surface opening when said manifold is in a closed position, and said second opening of said air supply housing being positioned so that it is opposite said manifold second

surface opening when said manifold is slidably moved to an extended position;

(d) first blocking means for blocking said first opening in said air supply housing when said manifold is in the extended position; and

(e) second blocking means for blocking said second opening in said air supply housing when said manifold is in the closed position;

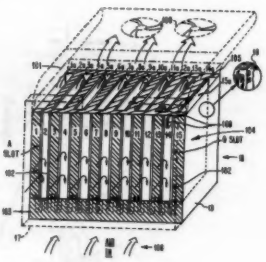
whereby cooling air flows from said air supply housing through said manifold, and into said article-containing enclosure by said air delivering means regardless of whether said manifold, and consequently said article-containing enclosure, is in the closed or extended position.

4,502,100

COOLING SYSTEM WITH COUNTER FLOW OF COOLANT

Stephen B. Greenspan, and Omkarnath R. Gupta, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,411
Int. Cl.³ H05H *7/20*
U.S. Cl. 361—384 **2 Claims**



1. A counter flow cooling assembly which cools electronic circuit cards with an air cooling agent, said assembly having enclosed rear, oppositely positioned side, and bottom surfaces and further having unenclosed front and top portions thereof and said assembly comprising;

support means including slotted receptacles on the rear inside surface of said assembly supporting an array of said circuit cards in spaced apart relationship from side to side within said assembly, each of said circuit cards having an area substantially congruent with the area of either of said side surfaces of said assembly and each circuit card in one dimension from rear to front of said assembly having substantially the same dimension as the rear to front dimension of a said side surface but each circuit card in a transverse direction from top to bottom within said assembly having a substantially shorter dimension than the top to bottom dimension of said side surfaces thereby establishing a common air flow area between the lowermost edges of said circuit cards and the bottom surface of said assembly;

a first set of air flow baffles positioned on the front edges of selected alternate pairs of said circuit cards to block and prevent passage of air between said selected alternate pairs of said circuit cards, said first set of air flow baffles further also defining entry passageways for passage of air between alternate pairs of circuit cards not blocked by said first set of air flow baffles;

a second set of air flow baffles abutting the top edges of said circuit cards to block and prevent passage of air between the top edges of the same selected alternate pairs of circuit cards having front entry passageways therebetween established by the first set of air flow baffles, said second set of air flow baffles further defining a set of exit passageways for passage of air between alternate circuit cards not blocked by said second set of air flow baffles;

a plenum mounted at the lowermost ends of said first set of air flow baffles to further define an air flow entry area for said assembly;

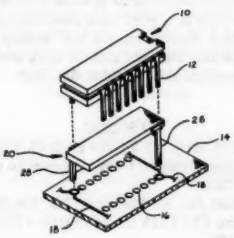
exhaust fan means directing air through said assembly including passage through said entry passageways at the front edges of said circuit cards, through said common air flow area, and through said exit passageways to establish flow of air through said systems substantially in a downward direction past even numbered alternate pairs of said circuit cards as air passes from said entry area to said common air flow area at the bottom of said circuit cards the air in going downwardly acquiring heat from the circuit cards and creating a thermal boundary layer relative to said circuit cards which starts from the top and which thickens downwardly, with the thicker boundary layer having a higher external thermal resistance, and to further establish flow of air substantially in an upward direction past odd numbered alternate pairs of said circuit cards as air passes from said common air flow area through said exit passageways, the now heated air in going upwardly acquiring additional heat from the circuit cards and creating a thermal boundary layer relative to said circuit cards that starts from the bottom of the cards and thickens upwardly, the thicker boundary layer having a higher external thermal resistance, thereby cooling said circuit cards more effectively due to counter flow passage of air on both sides of each circuit card which establishes uniform thermal resistance characteristics and enhanced boundary layer conditions all over said circuit cards.

4,502,101

DECOUPLED INTEGRATED CIRCUIT PACKAGE

Raymond C. Jodoin, Scottsdale, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 30, 1982, Ser. No. 403,408
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **8 Claims**



1. An electronic subassembly comprising:

an integrated circuit package, said circuit package having a plurality of pins extending outwardly therefrom in the same direction, said pins and a first surface of said package defining a space;

a circuit board, said circuit board having spaced holes receiving said circuit package pins, a pair of specially displaced of said holes defining power supply sockets; and

decoupling capacitor means, said decoupling capacitor means being positioned in said space and thus being interposed between said first surface of said circuit package and said board, said capacitor means comprising:

a flat rectangular body having a pair of opposed surfaces;

a metalized coating on each of said pair of opposed surfaces of said ceramic body;

an insulating film encapsulating said ceramic body and metalized surfaces, said conductors extending through said insulating film;

a conductor extending from each of said metalized coatings,

said conductors being received in said board power supply socket, said conductors extending outwardly and downwardly from points located adjacent opposite sides of said body.

4,502,102

COMBINATION FLASHLIGHT AND LAMP

Henri L. Phipps, Phipps Enterprises, 53 W. Fordham Rd., Bronx, N.Y. 10468

Filed Mar. 1, 1984, Ser. No. 585,275
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—183 **5 Claims**

1. A combination flashlight and lamp, comprising in combination: an elongated handle, a flared head portion at one end thereof for receiving a flashlight bulb, a removable lamp socket means at the other end of said elongated handle for receiving a lamp bulb, a flashlight switch positioned along said elongated handle for turning on and off of said flashlight bulb, a lamp switch contained in said lamp socket means for turning on and off of said lamp bulb, a plug contained in said flashlight for removably receiving a line cord from an AC power source for energizing said lamp bulb, a battery charger contained in said elongated handle for charging a rechargeable battery in said elongated handle which battery energizes the flashlight bulb, said battery charger being operated from the line cord, whereby with said flared head portion serving as a base and said handle serving as a post, said combination operates as a fixed lamp which also recharges the flashlight battery, and upon removal of the line cord and the lamp socket means, said combination operates as a portable flashlight.

4,502,103

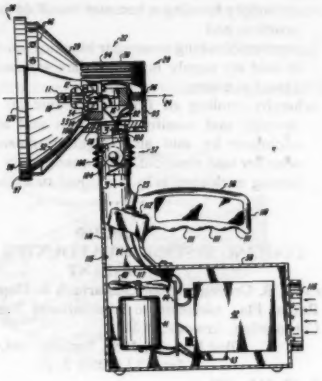
LIGHT WITH MOUNT FOR PLURAL LAMP BULBS

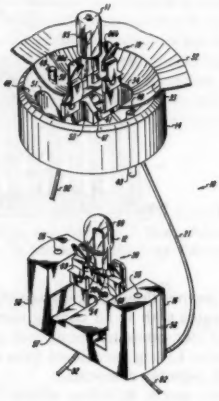
William J. Collins, Boulder, Colo., assignor to Collins Dynamics, Aurora, Colo.

Filed Jul. 30, 1982, Ser. No. 404,333
Int. Cl.³ F21V *21/00;* **H01R** *13/10*
U.S. Cl. 362—249 **6 Claims**

1. A mount for a light assembly for connecting two lamp bulbs in axial alignment along an axis of rotation of a geometrically shaped parabolis light reflecting member of the lamp assembly and in predetermined spaced relationship from the reflecting member on the axis of rotation to cause light emanating from one of the bulbs to be reflected from the reflecting member in a spot pattern and to cause light emanating from the other of the bulbs to be reflected in a flood pattern, said mount comprising:

a forward base of generally cylindrical configuration conformable with said reflecting member and having an opening therethrough central along said axis, said forward base having socket means connected thereto for supporting one of said lamp bulbs, and a rearward base connected to said forward base in a predetermined alignment, said rearward base having second socket means connected thereto for supporting another of said lamp bulbs, said another lamp bulb projecting through said opening in said forward base, and means operably connecting said bases, each socket means being substantially identical for physically retaining and electrically connecting either one of a





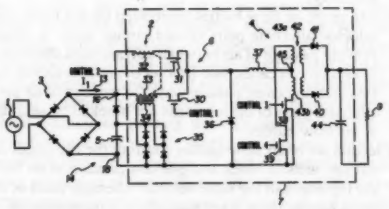
flanged type of halogen lamp bulb or a twin pin type of halogen bulb.

4,502,104

BOOTSTRAPPED AC-DC POWER CONVERTER

Daniel M. Mitchell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1982, Ser. No. 452,470
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—26 **6 Claims**



1. An AC to DC power converter, comprising:

means for providing a rectified voltage of an alternating current signal at an output;

means coupled to regulate voltage at said output for providing a regulated direct current voltage; and

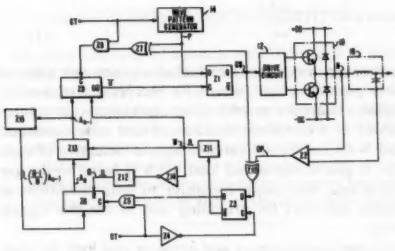
means coupled to said output for providing a predetermined direct current voltage level and responsive to said rectified voltage for maintaining voltage at said output at said predetermined direct current voltage level.

4,502,105

INVERTER FIRING CONTROL WITH PULSE AVERAGING ERROR COMPENSATION

Ralph D. Jessee, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,080
Int. Cl.³ H02M 1/12
U.S. Cl. 363—41 **11 Claims**



1. A pole switch firing control circuit for controlling a pulse width modulated inverter in accordance with a reference pulse signal, said control circuit comprising:

means for receiving a clock signal containing voltage pulses;

means for generating a control signal having transition points for initiating a pole switch switching sequence in the inverter;

a first counter, being presettable to start counting from a supplied number, for counting the number of said clock voltage pulses which occur between a selected transition point in said control signal and the switching of an associated pole switch and for dividing the counted number by a preselected number N to obtain an approximate average count equal to the sum of said supplied number and the counted number of clock pulses divided by N;

memory means for storing the approximate average count counted by said first counter during each pole switch switching sequence;

means for generating said supplied number wherein said supplied number is equal a selected previous approximate average count multiplied by the factor $(N-1)/N$; and

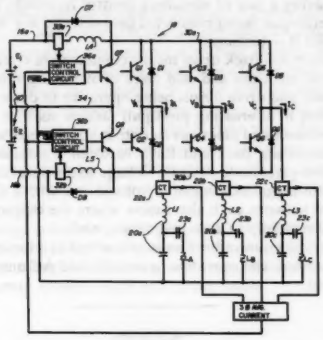
a second counter, being presettable to start counting at a selected previous approximate average count, and connected to count said clock voltage pulses which occur after a preselected transition point in said reference signal until a predetermined count has been reached, whereupon said second counter produces a carry output signal pulse which causes said means for generating a control signal to create a second transition point in said control signal, to initiate a second pole switch switching sequence in the inverter.

4,502,106

CURRENT SOURCE SINE WAVE INVERTER

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 17, 1983, Ser. No. 542,577
Int. Cl.³ H02H 7/122
U.S. Cl. 363—56 **16 Claims**



1. In an n-phase current source inverter for developing n-phase AC power from a DC source having two terminals each coupled to the inverter through a bus line and a rail associated therewith, a choke coil being connected between one of the bus lines and the associated rail, the inverter being switched between an on state in which current flows from the DC source through the inverter and a load connected thereto, and an off state, the improvement comprising:

a switch coupled between the rail associated with the one bus line and the other bus line;

first means for sensing the current level through the choke coil when the inverter is on;

second means for sensing the current level through the load; and

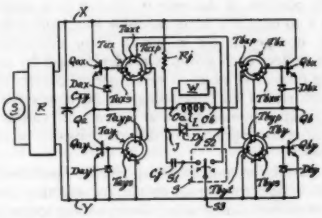
means connected to the first and second sensing means and the switch for closing the switch when the inverter is off to maintain current flow through the choke coil that sufficient load current is available to supply the load when the inverter is subsequently switched on.

4,502,107

FULL-BRIDGE ELECTRONIC INVERTER CIRCUIT

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Sep. 17, 1982, Ser. No. 419,495
Int. Cl.³ H02M 7/537
U.S. Cl. 363—133 **12 Claims**



1. An inverter circuit adapted to be powered from a source of DC voltage and operative to provide an AC output for a load, said source of DC voltage having a B+ terminal and a B− terminal, said circuit comprising:

a first pair of transistor switching means connected in series with one another at a first junction to form a first series-

pair, each of said transistor switching means having a pair of switching control terminals, said first series-pair being connected between said B+ terminal and said B− terminal;

a second pair of transistor switching means connected in series with one another at a second junction to form a second series-pair, each of said transistor switching means having a pair of switching control terminals, said second series-pair being connected between said B+ terminal and said B− terminal;

positive feedback drive means connected in circuit between said junctions and said pairs of switching control terminals, said drive means being operative to drive said series-pairs in alternating push-pull fashion such as to provide between said junctions an output voltage characterized by alternating back and forth between a substantially constant-magnitude positive voltage and a substantially constant-magnitude negative voltage, but with a distinct period between each alternation where the output voltage is substantially of zero magnitude; and

electrical connection means connected in circuit with said junctions and operative to provide said AC output for said load.

4,502,108

POSITION ERROR CORRECTION EQUIPMENT

Ryoichiro Nozawa, Shibuya; Tsuyoshi Nagamine, Hachioji; Hideaki Kawamura, Hachioji, and Mitsuto Miyata, Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

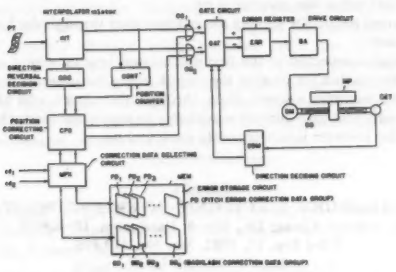
PCT No. PCT/JP81/00308, § 371 Date Jun. 29, 1982, § 102(e) Date Jun. 29, 1982, PCT Pub. No. WO82/01601, PCT Pub. Date May 13, 1982

PCT Filed Oct. 28, 1981, Ser. No. 395,005

Claims priority, application Japan, Oct. 30, 1980, 55-152874

Int. Cl.³ G06F *15/46*; G05B *19/18*

U.S. Cl. 364—170 **4 Claims**



1. Position error correction equipment for correcting an error in the position of movement relative to a commanded position in a numerical control machine tool, comprising:

an error storage circuit in which error correction data groups, where each group is predetermined by measurement in respective states of the numerical control machine tool, are stored corresponding to the respective states, each group containing plural correction values where each value corresponds to a different position or range of positions;

an error correction data selecting circuit, operatively connected to said error storage circuit, for selecting one of the error correction data groups corresponding to the particular state of the numerical control machine tool from the error correction data groups stored in the error storage circuit; and

a position correcting circuit, operatively connected to said error correction data selecting circuit and the numerical control machine tool, for correcting the error in the position of movement in dependence upon the correction values associated with the position in the error correction data group selected by the error correction data selecting circuit.

4,502,109

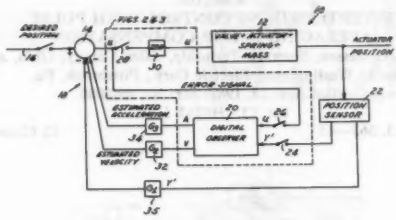
APPARATUS FOR ESTIMATING PLURAL SYSTEM VARIABLES BASED UPON A SINGLE MEASURED SYSTEM VARIABLE AND A MATHEMATICAL SYSTEM MODEL

Arthur H. Delmege, Detroit; Yehia M. El-Ibiary, Troy; Melvin A. Rode, W. Bloomfield, and Lael B. Taplin, Union Lake, all of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Filed Sep. 14, 1982, Ser. No. 418,086

Int. Cl.³ G05B *15/00*; G05D *3/00*

U.S. Cl. 364—174 **11 Claims**



1. A power servo system which includes an actuator adapted to variably position a load, means for receiving a state command signal, means for providing an error signal to control said actuator as a combined function of said state command signal and N dynamic state variable signals indicative of state conditions at said actuator and load, with N being an integer greater than one, and means reponsive to state conditions at said actuator and load for providing said N variable signals comprising:

sensor means responsive to said actuator and load for providing a first signal as a function of one dynamic state variable at said actuator; and

observer means responsive to said first signal for estimating the remaining N−1 of said N dynamic state variable signals at said actuator and load as a function of a mathematical model of dynamic behavior at said actuator and load, said observer means comprising

means for periodically sampling said error signal and said first signal,

a plurality of adjustable means for selective adjustment as a function of said dynamic behavior at said actuator and load, and

programmed digital computation means for selectively and periodically operating said sampling means, and responsive to the sampled error and first signals and to said adjustable means for estimating said N−1 dynamic state variable signals.

4,502,110

SPLIT-CACHE HAVING EQUAL SIZE OPERAND AND INSTRUCTION MEMORIES

Masato Saito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 214,932

Claims priority, application Japan, Dec. 14, 1979, 54-163260

Int. Cl.³ G06F *9/38*

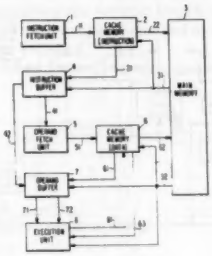
U.S. Cl. 364—200 **6 Claims**

1. In a data processing system, a memory control apparatus connected to a main memory unit (MMU) and a processing unit (PU), said processing unit including an instruction fetch unit, an operand fetch unit, and an execution unit, said control apparatus comprising:

a data cache memory (6) for storing a copy of a portion of a plurality of data stored in the MMU;

an instruction cache memory (2) having the same memory capacity as said data cache memory for storing a copy of a portion of a plurality of instructions stored in the MMU; and

each of said instruction cache memory (2) and data cache memory (6) including address storing means (204) and data storing means (208), said data cache memory (6) being connected to the operand fetch unit (5) via a first line (51) and said instruction cache memory (2) being



connected to the instruction fetch unit (1) via a second line (11);

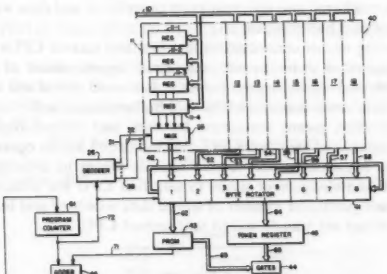
whereby the ratio of missing probabilities, θ is minimized, and the average instruction execution time is shortened relative to that of a conventional single cache memory having a capacity equal to the combined capacities of the data cache memory and the instruction cache memory, and the average instruction execution time is shortened relative to a conventional split-cache having unequal size stores where the instruction cache memory has a different storage capacity from that of the data cache memory.

4,502,111

TOKEN GENERATOR

Josephus Riffe, Plantation, and Richard Rice, West Palm Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 29, 1981, Ser. No. 268,370
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **20 Claims**



1. For use in a data processing system wherein a sequence of data messages of variable length are to be processed, an arrangement for separating the individual data messages from each other for processing comprising:

a memory having a plurality of M storage sections, each storage section containing N memory stages thereby defining a matrix of NXM memory stages and into which memory stages successive data messages of variable length are coupled so as to be stored therein, with each respective section including means for coupling the contents of a selected one of the stages of that section to an output of said respective section;

first means, coupled to the outputs of the respective sections of said memory, for retrieving and storing in respective sections of said first means the contents of selected stages of predetermined ones of successive storage sections of said memory;

second means, coupled to said first means, for arranging the contents of said retrieved and stored selected stages of predetermined ones of successive storage sections of said memory as stored by said first means in a prescribed order, so that at least the contents of those selected stages of predetermined ones of successive storage sections of said memory in said first means which make up at least one complete data message are in sequence, said second means including means for specifying the length of said data message in terms of the number of stages therefor in said memory; and

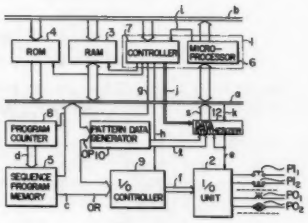
third means, coupled to said first and second means, for reading out a prescribed portion of the contents stored in said first means which forms said complete data message in response to said length specifying means.

4,502,112

SEQUENCE CONTROL APPARATUS

Katsuhiro Fujiwara, and Kazuyoshi Osako, both of Narashino, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,341
Claims priority, application Japan, Jul. 18, 1980, 55-97554
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **8 Claims**



1. A sequence control apparatus comprising:

(a) means including a program memory for storing a sequence program made up of a combination of instructions each of which has an operation part and an operand part and consists of a plurality of bits, said sequence program serving to control a multiplicity of output instruments into predetermined conditions in response to condition signals produced from a multiplicity of input instruments; and

(b) operation processing means for sequentially reading out said instructions from said program memory, for sequentially taking in the condition signals of designated ones of said input instruments in accordance with said sequence program and for controlling said output instruments into said predetermined conditions in response to the condition signals received from said input instruments, including

(b—1) a microprocessor having an accumulator for temporarily storing data made up of a plurality of bits, said microprocessor including means for performing predetermined processing operations on words having a predetermined plural numcer of bits in accordance with the operation part of a read out instruction,

(b—2) pattern data generating means for generating pattern data having a predetermined bit arrangement corresponding to the processing operation required by the operation part of each instruction read out from said program mem-

ory, the number of bits of said pattern data being less than the bit capacity of said accumulator and

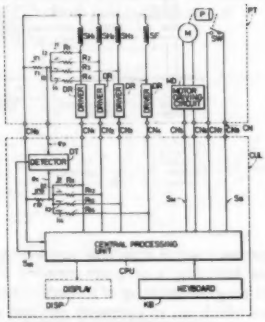
(b—3) data synthesizing means for forming the pattern data generated from said pattern data generating means and the condition signal received from one of said input instruments designated by an operand part of an instruction, in response to the operation part of which instruction said pattern data is generated from said pattern data generating means, and including means for sending the resulting composite data to said microprocessor in the form of plural bits corresponding in number to the bit capacity of said accumulator and for storing said composite data in said accumulator, the predetermined bit arrangement of said pattern data generated by said pattern data generating means being such that the values of the bits present in said accumulator and corresponding in position to the respective bits of said pattern data are not changed from the result required by the logical operation called for by said instruction when said composite data is stored in said accumulator.

4,502,113

SYSTEM FOR CHECKING AN ELECTRICAL CONNECTION BETWEEN A COMPUTER AND A PRINTER

Haruhisa Katoh, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,575
Claims priority, application Japan, May 26, 1981, 56-80621
Int. Cl.³ G06F 3/12
U.S. Cl. 364—200 6 Claims



1. An electronic system comprising:

a central processing unit for generating driving signals;

a printer unit detachably connected to said central processing unit and having a plurality of printing elements and a plurality of drivers each for operating a respective one of said printing elements in response to a driving signal;

a plurality of conductive paths each electrically connecting said central processing unit to one of said drivers for conducting a driving signal thereto; and

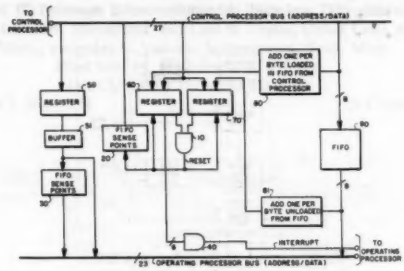
detecting means for detecting an incomplete electrical condition in said plurality of conductive paths, said detecting means comprising means provided in said central processing unit for generating a first signal representing a sum of said driving signals from said central processing unit, means provided in said printer unit for generating a second signal representing a sum of said output signals from the drivers, the first and second signals being generated with the same timing, and a comparator for examining coincidence in amplitude between said first and second signals to issue a signal indicative of the incomplete electrical connection condition in said conductive paths.

4,502,114

CIRCUIT FOR RELIABLE DATA TRANSFER BETWEEN TWO CENTRAL PROCESSING UNITS

Krikor A. Krikor, Glendale, and Kuang-Cheng Hu, Phoenix, both of Ariz., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Oct. 29, 1982, Ser. No. 437,647
Int. Cl.³ G06F 15/16
U.S. Cl. 364—200 7 Claims



1. A circuit for reliable data word transfer is connected between a first and a second CPU for said data word transfer between said CPUs, said circuit comprising:

first and second CPU buses respectively connected between said first and second CPUs and said circuit;

buffer means connected to said first and second CPUs via said first and second buses and said buffer means operated to store and to transmit a number of said data words from said first to said second CPU;

said buffer means having a maximum capacity of said data words;

first register means connected between said first and second CPUs and operated to store a representation of a particular number of said data words to be transferred from said first to said second CPU;

said second CPU operated to receive said stored representation of said particular number of data words;

second register means connected between said first and second CPUs and operated to store a representation of the difference between the number of said data words to be transferred and said maximum capacity of said data words of said buffer means;

adding means connected to said first and second CPUs and operated to increment said stored representation of said second register means for each data word stored and each data word transmitted by said buffer means; and

indication means connected between said second register means and said first CPU, said indication means operated in response to said second register means to provide an acknowledgement signal to said first CPU for indicating said particular number of stored data words of said buffer means are transferred to said second CPU.

4,502,115

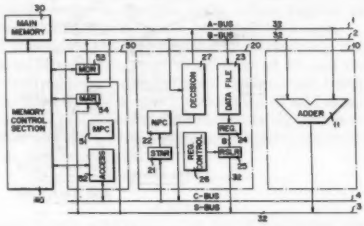
DATA PROCESSING UNIT OF A MICROPROGRAM CONTROL SYSTEM FOR VARIABLE LENGTH DATA

Kazutoshi Eguchi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 22, 1982, Ser. No. 421,310
Claims priority, application Japan, Sep. 30, 1981, 56-155188
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 12 Claims

1. A data processing unit for transferring variable length data having a data length from one area of a main memory to another area of said main memory, comprising:

a. a memory address register holding a write address and a read address of said main memory;
b. a memory data register holding write data for and read data from said main memory;
c. access type deciding means, receiving, as input data, the data length of the variable length data and a lower two bits of a start write address set in said memory address register, and producing a number of bytes to be written and a command which indicates a type of write operation from among byte write, half-word write and full-word write in accordance with the input data;
d. a data buffer for storing the variable length data which is read out from said main memory, coupled to the output of said memory data register;
e. a result register for temporarily holding data, the output of



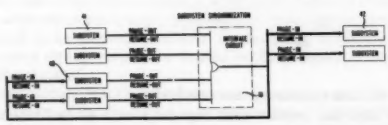
said result register being coupled to said memory data register;
f. register controlling means for reading out and arraying a portion of the variable length data from said data buffer into said result register in units of one byte according to said command;
g. memory controlling means for transferring said portion to said memory data register and for writing said portion from said memory data register starting at the write address of said main memory held by said memory address register in accordance with said command; and
h. memory address updating means for adding the number of bytes to be written produced by said access type deciding means to the write address, and for setting an updated write address in said memory address register for a next memory access.

4,502,116

MULTIPLE PROCESSOR SYNCHRONIZED HALT TEST ARRANGEMENT

Glenn D. Fowler, Canal Winchester, Ohio; Patrick A. Shannon, Oak Park, Ill.; Ronald L. Stout, Elgin, Ill., and Jean Yao, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 17, 1982, Ser. No. 442,353
Int. Cl.[3] G06F *15/16*
U.S. Cl. 364—200 **12 Claims**



1. In an arrangement for testing a multiprocessing system comprising a plurality of processors, the combination comprising

means in one of said processors for generating a pause signal to request a pausing of an execution of a sequence of program instructions by other of said processors, and

means responsive to a generated pause request signal from said one of said processors to produce a pause control signal; and

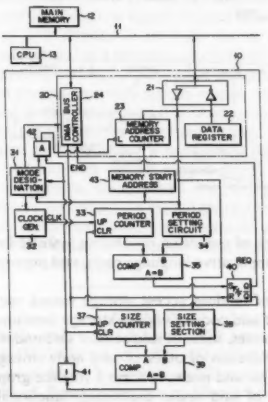
each of said other of said processors comprising means responsive to said pause control signal to halt said execution of sequence of program instructions.

4,502,117

DMA BUS LOAD VARYING UNIT

Jyun-ichi Kihara, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 24, 1983, Ser. No. 469,300
Claims priority, application Japan, Mar. 4, 1982, 57-34468
Int. Cl.[3] G06F *11/00, 13/00, 15/40*
U.S. Cl. 364—200 **6 Claims**



1. A DMA bus load varying unit applied to a data processing system having a DMA bus and a memory connected to the DMA bus, comprising:

a. mode-designating means for designating a memory read and write operation, a continuous operation of the memory read and write operation, and a memory start and a memory stop operation of the memory read and write operation;
b. clock-pulse generating means connected to said mode-designating means;
c. first counting means connected to said clock-pulse generating means for counting clock signals from said clock-pulse generating means;
d. period-setting means for specifying an arbitrary period;
e. first comparing means for comparing the output from said first counting means with the output from said period-setting means and for producing a first coincident signal when they are equal;
f. DMA bus request sign-[1] generating means connected to said first comparing means for producing the DMA bus request signal in accordance with the coincident signal;
g. DMA bus circuit means connected to said mode-designating means and said DMA bus request signal generating means which is triggered by the DMA bus request signal and performs the memory access through the DMA bus in accordance with the mode designated by said mode-designating means;
h. second counting means connected to said DMA bus circuit means for counting the number of DMA bus cycles of said DMA bus circuit means;
i. transfer data size-setting means for specifying an arbitrary transfer data size; and
j. second comparing means for comparing the output from said second counting means and the output from said transfer data size-setting means and for producing a second coincident signal when they are equal, the second

coincident signal being supplied to initialize said DMA bus circuit means.

4,502,118

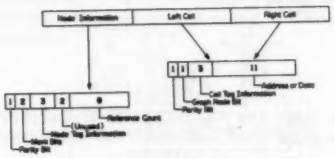
CONCURRENT NETWORK OF REDUCTION PROCESSORS FOR EXECUTING PROGRAMS STORED AS TREELIKE GRAPHS EMPLOYING VARIABLE-FREE APPLICATIVE LANGUAGE CODES

Carl F. Hagenmaier, Jr., Pittstown, N.J.; Gary L. Logsdon, Round Rock, Tex.; Brent C. Bolton, and Robert L. Miner, Jr., both of Austin, Tex., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 281,065, Jul. 7, 1981,. This application Sep. 7, 1983, Ser. No. 530,066

Int. Cl.[3] **G06F** *13/00, 15/00*

U.S. Cl. 364—200 **12 Claims**



1. A network of reduction processing systems for executing variable-free applicative language code, said network comprising:

a plurality of random access storage means each storing a portion of said code in various storage locations therein as two-cell nodes, some of said cells of said nodes containing storage addresses of other of said node storage locations so as to link said nodes to form a treelike graph, other of said cells of said nodes containing functional variables, still other of said cells of said nodes containing operators each of which defines a reduction transformation of a graph containing that operator, to a new graph not containing that operator; and

a plurality of processor means, one for each random access storage means, each processor means including retrieving means coupled to said corresponding one of said random access storage means to retrieve said graph and transformation means to produce a reduced graph through execution of one or more steps of a series of said graph transformations defined by one or more of said operators in said graph.

4,502,119

ELECTRONIC REGISTER

Hanzo Tsuzuki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,593

Claims priority, application Japan, Nov. 12, 1980, 55-158141

Int. Cl.[3] **G06F** *15/02, 15/20*

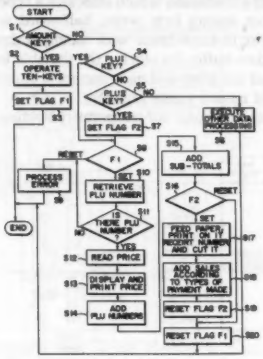
U.S. Cl. 364—405 **2 Claims**

1. An electronic cash register comprising:

inputting means including: numeral keys for inputting code data corresponding to goods being sold; at least one payment type key for designating at least one of different payment types; a first price look-up key for initiating an addition of a number of sold goods of a given type corresponding to said code data; and a second price look-up key for initiating an addition of the number of sold goods corresponding to said code data and an addition of a price of sold goods for one of said different payment types;

memory means including: a price look-up memory having a plurality of respective storing areas for storing unit prices of goods corresponding to said code data inputted by said numeral keys and for storing a total number of sold goods; and a payment type memory having storing area for storing a total amount of sales for one of said different payment types;

arithmetic means coupled to said inputting means and to said memory means, for adding "+1" to said total number of sold goods corresponding to said code data in response to the operation of said first price look-up key, and for adding "+1" to said total number of sold goods and for adding a unit price of said sold goods, which corresponds



to said code data and is read from said price look-up memory, to said total amount of sales in response to the operation of said second price look-up key; and

receipt issuing means coupled to said arithmetic means for issuing a receipt having said price printed thereon, after said arithmetic means performs the addition for obtaining the total number of sold goods and the addition for obtaining the total amount of sales in response to the operation of said second price look-up key.

4,502,120

SYSTEM FOR DATA TRANSMISSION BETWEEN ELECTRONIC CASH REGISTERS

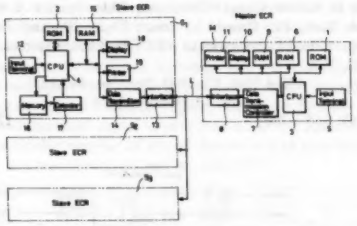
Souichi Ohnishi, Yao, and Fusahiro Shiono, Habikino, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1982, Ser. No. 381,221

Claims priority, application Japan, May 29, 1981, 56-82740

Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—405 **9 Claims**



1. A cash register system comprising:

at least one remote cash register means for accumulating transaction data;

master cash register means operatively interconnected to said remote cash register means for accumulating all said transaction data accumulated by each said remote cash register means;

each said remote cash register means including,

input means for introducing data into said remote cash register means,

remote register memory means responsive to said introduced data for storing said data, and

means for transmitting said data stored in said remote register memory means to said master cash register means; said master cash register means including,

means for receiving data transmitted by said remote cash register means, and

accumulator means for accumulating the data from each said remote cash register means, said accumulator means having master register memory means for storing said accumulated data, said master register memory means having a predetermined memory capacity;

at least one memory means associated with at least one of said remote register means having a remote memory capacity greater than said predetermined memory capacity of said master register memory means;

means for informing said master cash register means of the remote memory capacity of the remote register memory means of each said remote cash register means;

said transmitting means repeatedly transmitting only portions of said data sized to correspond to said predetermined memory capacity, each said portion being being received by said means for receiving of said master cash register, said repeated transmission being terminated only after all data within said remote register memory means has been transmitted.

4,502,121

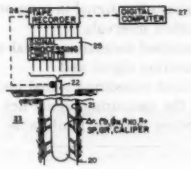
MACHINE METHOD FOR DETERMINING THE PRESENCE AND LOCATION OF HYDROCARBON DEPOSITS WITHIN A SUBSURFACE EARTH FORMATION

Christian M. Clavier, Ridgefield, Conn.; Jean L. Dumanoir, Houston, Tex., and Alexis C. Dumestre, Danbury, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 112,004, Feb. 2, 1971, abandoned. This application Mar. 12, 1979, Ser. No. 19,492

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—422 **24 Claims**



1. A machine method for exploring subsurface earth formations to determine the presence and location of hydrocarbon deposits within the earth formation surrounding a borehole formed in the earth formation by probing a plurality of depth levels over a borehole section of such subsurface earth formation with one or more signals produced in investigating devices adapted to be suspended in said borehole and acquiring and analyzing signals responsive to said probing signals, comprising the steps of:

(a) providing first electrical signals representative of the bulk density of the formation over a plurality of depth levels of the borehole, said first electrical signals being derived from signals responsive to the reaction of the subsurface earth formation to gamma rays emitted into said subsurface earth formation surrounding the borehole from a source of gamma rays located in one of said investigating devices;

(b) providing second electrical signals representative of the hydrogen content of the formation over a plurality of depth levels of the borehole, said second electrical signals being derived from signals responsive to the reaction of the subsurface earth formation to neutrons emitted into the subsurface earth formation surrounding the borehole from a source of neutrons located in one of said investigating devices;

(c) providing at least third electrical signals representative of formation shale content over a plurality of depth levels of the borehole, said at least third electrical signals being derived from the formation surrounding the borehole;

(d) combining said electrical signals to produce first and second output electrical signals for a plurality of depth levels related to shale corrected values of said hydrogen content and bulk density electrical signals respectively;

(e) comparing said first output electrical signals related to shale corrected values of hydrogen content with said second output electrical signals related to shale corrected values of bulk density to produce one or more further electrical signals for a plurality of depth levels indicative of the presence of hydrocarbons or the accuracy of said first and second electrical signals output; and

(f) adjusting at least one of said first or second output electrical signals in response to one of said further output electrical signals to bring about a preselected relationship between said first and second output electrical signals related to hydrogen content and related to bulk density, respectively, and making a record thereof over a plurality of depth levels from which the presence and location of hydrocarbon deposits within the subsurface earth formation can be determined.

4,502,122

METHOD AND APPARATUS FOR MEASURING VEHICLE DRIVER'S FATIGUE TO GIVE AN ALARM

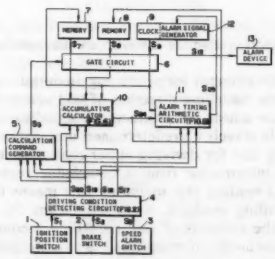
Takayuki Yanagishima, Yokosuka, and Yasutoshi Seko, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 1, 1982, Ser. No. 384,031

Claims priority, application Japan, Jun. 3, 1981, 56-84425

Int. Cl.³ G08B *21/00*

U.S. Cl. 364—424 **26 Claims**



20. A system for detecting fatigue of an automotive vehicle driver and for alarming the driver when detected fatigue exceeds a predetermined allowable level, comprising:

a timer means for sequentially measuring elapsed time to produce a timer signal having a value indicative of the measured elapsed time;

a detector means for detecting vehicle driving conditions including a first condition in which the driver is substantially resting and a second condition in which the driver's fatigue accumulates at a greater rate than that accumulated under normal driving condition, said detector means producing a detector signal having a value variable according to the detected vehicle driving condition;

arithmetic means for deriving a fatigue value representative of accumulated driver fatigue on the basis of the values of

said timer signal and said detector means signal, said arithmetic means producing a fatigue value indicative signal having a value indicative of the derived fatigue value;

a reference signal generator means producing a reference signal having a value representative of a time threshold corresponding to said predetermined allowable fatigue level, said reference signal generator means being responsive to said detector means signal and to said fatigue value indicative signal for modifying the value of said reference signal;

a comparator means for comparing the value of said timer signal with the value of said reference signal as modified to produce a comparator signal when the value of said timer signal is greater than the value of said reference signal as modified; and

an alarm generator means responsive to said comparator signal to generate the alarm.

4,502,123

NAVIGATION SYSTEM FOR USE WITH AN AUTOMOBILE AND READING UNIT FOR THE SYSTEM

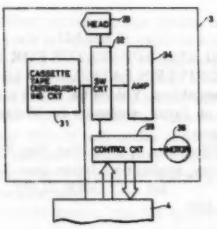
Kazuaki Minami, Kariya; Shinzo Totani, Nagoya; Kunio Miura, Okazaki; Kazushi Akutsu, and Shinji Ohyama, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 6, 1982, Ser. No. 395,338

Claims priority, application Japan, Jul. 7, 1981, 56-106570

Int. Cl.³ G06F *15/50*

U.S. Cl. 364—424 **9 Claims**



8. A navigation system for use with an automobile, comprising:

(a) a direction detector for producing an output signal indicative of the travelling direction of said autombile;

(b) a distance sensor for producing a signal each time said automobile travels a predetermined unit distance;

(c) a reading unit for deriving either road map information or audio information from a detachable recording medium, said reading unit including first means for driving said recording medium, a second means for detecting whether the contents of said recording medium is road map data or audio information so as to distinguish recording medium carrying said road map data from other recording medium carrying audio information; and fifth third means for outputting, via a first output terminal, road map data read out from said recording medium only when said recording medium has been determined by said second means as carrying said road map data, and for outputting, via a second output terminal, audio information read out from said recording medium only when said recording medium has been determined by said second means as carrying said audio information;

(d) a microcomputer, responsive to the road map information from said first output terminal of said third means for producing first output data, and to the output signals from said direction detector and said distance sensor for producing second output data;

(e) a display controller, responsive to said first and second output data, for producing a video signal; and

(f) a display unit responsive to said video signal for displaying said road map data as well as the present location of the automobile.

4,502,124

PROCESS FOR DETERMINATION OF THE STORED QUANTITY OF OPERATING FLUIDS FOR AUTOMOTIVE VEHICLES, AND CIRCUIT FOR CONDUCTING THE PROCESS

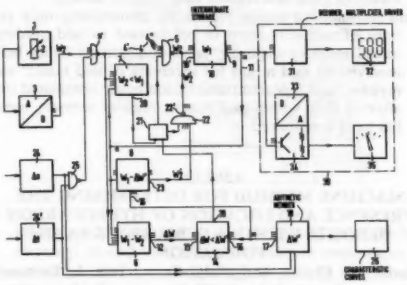
Kurt Grohmann, and Walter Weishaupt, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,793

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928767

Int. Cl.³ G06F *15/48*

U.S. Cl. 364—442 **24 Claims**



1. A process for the determination of the stored quantity of operating fluids for automotive vehicles, wherein a measuring signal of a quantity of operating fluids is indicated, characterized in

storing the measuring signal,

transmitting said stored signal for indication,

interrupting the storing of the measuring signal upon an acceleration-dependent change in the liquid level,

determining the measuring signal in temporally or distance-dependent, identical intervals,

comparing a determined measuring signal with a preceding determined measuring signal and

storing a standardized measuring signal instead of the measuring signal if the measuring signal lies above an upper limit value or below a lower limit value.

4,502,125

NUMERICAL CONTROLLER FOR AN ANGULAR SLIDE GRINDING MACHINE

Takao Yoneda, Toyoake, and Yasuji Sakakibara, Hekinan, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 18, 1983, Ser. No. 458,823

Claims priority, application Japan, Jan. 29, 1982, 57-13857

Int. Cl.³ G06F *15/46;* E05D *15/22;* H02M *5/16, 5/22*

U.S. Cl. 364—474 **7 Claims**

1. A numerical controller for a grinding machine wherein a work table rotatably carrying a workpiece and having a dressing tool fixed thereon is movable in a first direction parallel with the rotational axis of said workpiece and wherein a wheel head rotatably carrying a grinding wheel is movable in a second direction which makes an acute angle with said first direction, comprising:

a first counter for indicating a present position of said work table in a machine coordinate system which originates from an original table position spaced a predetermined distance from an original machine position in said first direction, said original machine position being defined by

an end surface of said grinding wheel when a cylindrical surface of said grinding wheel reaches the axis of said workpiece;

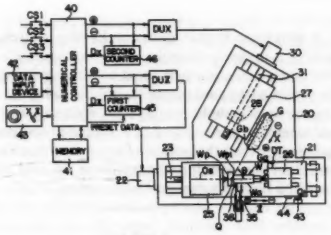
a second counter for indicating a present position of said wheel head as a distance between said axis of said workpiece and said cylindrical surface of said grinding wheel;

said present positions respectively indicated by said first and second counters being for use in controlling movements of said work table and said wheel head in accordance with numerical control data;

first data processing means responsive to said present positions respectively indicated by said first and second counters when said work table is moved to such a position as to bring said dressing tool into slight contact with said end surface of said grinding wheel, for calculating a dressing reference value indicative of a positional relation between said machine original position and said dressing tool;

first storage means for storing said dressing reference value calculated by said first data processing means;

data setting means for setting in said first counter a distance between said original machine position and a reference end surface of said workpiece in said first direction when under the control of a sizing device engageable with said



workpiece said work table is positioned to present said reference end surface to a predetermined positional relation with said original machine position, so as to enable said first counter to indicate said present position of said work table in a workpiece coordinate system prior to a grinding operation of said workpiece;

second data processing means for obtaining a coordinate difference between said machine coordinate system and said workpiece coordinate system when under the control of said sizing device said work table is positioned to set said reference end surface of said workpiece in said predetermined positional relation with said original machine position;

second storage means for storing said coordinate difference obtained by said second data processing means; and

third data processing means responsive to said dressing reference value and said coordinate difference respectively stored in said first and second storage means and said present position indicated by said second counter when said wheel head is at a dressing start position thereof, for calculating a dressing start position of said work table in said workpiece coordinate system prior to a dressing operation which is performed following said grinding operation.

4,502,126

APPARATUS FOR DETECTING AN AMOUNT OF LIQUID REMAINED IN A VESSEL

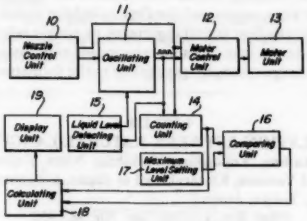
Fumio Mizoguchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,478

Claims priority, application Japan, May 21, 1981, 56-72793[U]

Int. Cl.³ G01F *13/00*

U.S. Cl. 364—509 **13 Claims**



1. An apparatus for detecting a residual amount of a liquid to be delivered by a delivery nozzle which is moved downward into contact with the surface of the liquid for selectively withdrawing a portion of the liquid, said apparatus comprising:

means for detecting a distance along which the nozzle is moved downward from a reference level until the tip of the nozzle contacts the surface of the liquid;

and

calculating means for processing said detected distance to calculate a residual amount of the liquid, said calculating means comprising means for deriving a difference between said detected distance and a predetermined maximum distance, and a calculating unit to calculate the residual amount of the liquid from said difference.

4,502,127

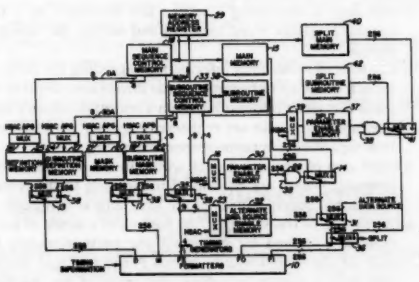
TEST SYSTEM MEMORY ARCHITECTURE FOR PASSING PARAMETERS AND TESTING DYNAMIC COMPONENTS

R. F. Garcia, San Jose, and Robert L. Hickling, Sunnyvale, both of Calif., assignors to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Filed May 17, 1982, Ser. No. 378,937

Int. Cl.³ G06F *11/00, 13/00*; G01R *31/28*

U.S. Cl. 364—900 **13 Claims**



1. A test system memory architecture comprising:

main data storage means for storing test data;

main mask storage means for storing first type information;

main definition storage means for storing second type information;

main control storage means connected to the main data

storage means and to each of the main mask storage means and the main definition storage means for storing control information to control the main mask storage means and the main definition storage means;

subroutine data storage means for storing test data;

subroutine control storage means connected to the subroutine data storage means for storing control information;

first switching means connected to the main data storage means, the subroutine data storage means, and a formatting means; and

parameter enabling means connected to the subroutine control storage means and the first switching means for controlling the first switching means to enable selected data stored in the main data storage means and the subroutine data storage means to be supplied to the formatting means.

4,502,128

TRANSLATION BETWEEN NATURAL LANGUAGES

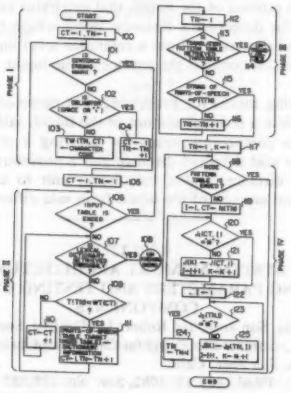
Atsushi Okajima, Yokohama; Yoshihiko Nitta, Fujisawa, and Fumiyuki Yamano, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,952

Claims priority, application Japan, Jun. 5, 1981, 56-85722

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 **11 Claims**



1. A method of performing translations between first and second natural languages comprising:

a first step of sectioning a source text described by a first natural language word by word and storing the words in storage;

a second step of deriving information regarding the parts-of-speech of the stored source words through retrieval of the parts-of-speech information from a lexical dictionary storage in which words are registered together with information regarding the parts-of-speech thereof;

a third step of deriving target words in the second natural language which are equivalent in meaning to the respective stored source words in the first natural language;

a fourth step of translating a first pattern of a string of parts-of-speech formed by gathering the parts-of-speech for each of the stored source words derived in said second step into a pattern in which the order of the parts-of-speech is in accordance with said first natural language, into a second pattern of a string-of-parts of speech with an order in accordance with said second natural language by referring to a translation pattern table which registers therein the correspondences between first patterns of parts-of-speech strings defining sequences of parts-of-speech of the first natural language and second patterns of parts-of-speech strings defining sequences of parts-of-speech of the second natural language; and

a fifth step of generating a sentence in the second natural language by sequencing said target words in accordance with the sequential order of the parts-of-speech in said translated second pattern of the string of parts-of-speech of said second natural language.

4,502,129

MAGNETIC BUBBLE DETECTOR

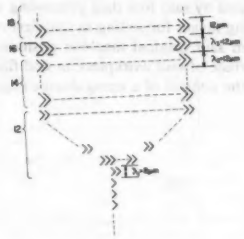
Ryo Suzuki, Kodaira; Minoru Hiroshima, Hachioji; Masatoshi Takeshita, Tokorozawa, and Yutaka Sugita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,486

Claims priority, application Japan, Jun. 18, 1982, 57-103825

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **7 Claims**



1. A magnetic bubble detector having a stretcher part for stretching a magnetic bubble while propagating said magnetic bubble and a detection part for detecting said magnetic bubble while propagating said magnetic bubble, wherein the period of arrangement of bubble propagation elements forming the exit of said stretcher part viewed in a bubble propagation direction is made larger than the period of arrangement of bubble propagation elements forming the entrance of said stretcher part viewed in a bubble propagation direction.

4,502,130

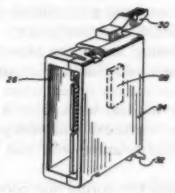
REMOVABLE MEMORY PACKAGE, ASSOCIATED APPARATUS AND METHOD OF USE

William R. Kuckuk, Grafton, Wis., assignor to Square D Company, Palatine, Ill.

Filed May 13, 1982, Ser. No. 377,899

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—52 **3 Claims**



1. A memory package for connection to an interface switching circuit of a programmable controller for receiving a program from the programmable controller, storing the program at a location that may be remote from the programmable controller, and returning the program to the programmable controller, the memory package comprising:

An erasable programmable read-only memory (EPROM);

a releasable holder supporting the EPROM physically and connected electrically to it; and

means for effecting an electrical connection between the

releasable holder and the programmable controller to connect the programmable controller electrically to the EPROM to store a program from the programmable controller in the EPROM and to read a program from the EPROM into the programmable controller.

4,502,131

ELECTRICALLY PROGRAMMABLE MEMORY MATRIX

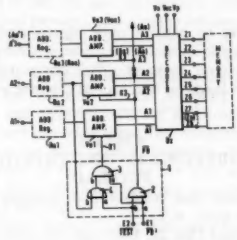
Burkhard Giebel, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,528

Claims priority, application European Pat. Off., Sep. 22, 1982, 82108757.4

Int. Cl.³ G11C *29/00*

U.S. Cl. 365—201 **9 Claims**



1. An electrically programmable memory matrix comprising:

a plurality of memory cells arranged in a matrix of "n" rows, the memory cells in each of said rows being coupled to one of a plurality of "n" row selecting lines, each of said row selecting lines controlling "m" memory cells;

a plurality of "a" row address circuits wherein $n=2^a$, each of said address circuits having an input terminal, first and second output terminals, and a control terminal, each address circuit being responsive to a first control signal level at said control terminal such that an address bit signal at said input terminal is coupled to said first output terminal and the complement of said address bit signal is applied to said second output terminal, each address circuit being responsive to a second control signal level at said control terminal such that said first and second output terminals are maintained at the same output signal level;

a row decoder having "n" outputs, and "a" pairs of input terminals, each of said row decoder outputs being coupled to one of said row selecting lines and each pair of input terminals being coupled to one of said row address circuits with one terminal of said pair of input terminals being coupled to said first output terminal and the other terminal of said pair of input terminals being coupled to said second output terminal, said row decoder being operable to supply a ground potential, a supply potential or a programming potential to each of said row decoder outputs;

a control circuit having a first input for receiving a first mode control signal, a second input for receiving a test control signal, a first output coupled to the control terminal of one of said address circuits, a second output coupled to the control terminals of the remaining ones of said address circuits, and a third input coupled to the input terminal of one of said remaining ones of said address circuits, said control circuit being responsive to a first test signal level at said control circuit first input and a first activating signal level at said control circuit second input such that said first control signal level is generated at said first and second control signal outputs, said control circuit being responsive to said first test signal level at said control circuit first input and a second activating signal level at said control circuit second input such that said second control signal level is generated at said first and second control signal outputs, said control circuit being responsive to a second test signal level at said control circuit first input such that said second control signal level is generated at said second control signal output and the signal level at said first control signal output is determined by the signal level at said third input.

4,502,132

POWER SWITCH APPARATUS

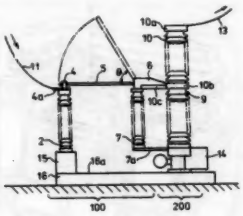
Akira Nishikawa; Toru Saito, and Kenichi Otsuka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 539,057

Claims priority, application Japan, Oct. 9, 1982, 57-178029; Apr. 29, 1983, 58-76707

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—332 **12 Claims**



1. A power switch apparatus including a disconnect switch part and a breaker part, comprising:

a common frame;

a fixed contact supporting insulator mounted at one end thereof on said common frame;

a fixed contact supported on the other end of said fixed contact supporting insulator;

a common supporting insulator having one end thereof mounted on said common frame apart from said fixed contact supporting insulator, the other end of said common supporting insulator being at substantially the same height as that of said other end of said fixed contact supporting insulator;

driving means mounted on said other end of said common supporting insulator, disposed at substantially the same height as that of said the other end of said fixed contact supporting insulator;

a moving contact movably mounted on said driving means and positioned to establish contact between the free end of said moving contact and said fixed contact when said moving contact is driven by said driving means;

a driving insulator having one end thereof connected to said driving means, said driving means driving said moving contact through said driving insulator; and

a breaker mounted on said other end of said common supporting insulator.

4,502,133

AUTOMATIC HANDLING MECHANISM FOR AN OPTICAL DISC ENCLOSED IN A PROTECTIVE CARTRIDGE

Bohdan W. Siryj, Cinnaminson, and Angelo G. Lazzery, Oaklyn, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,489

Int. Cl.³ G11B *17/00, 5/48*

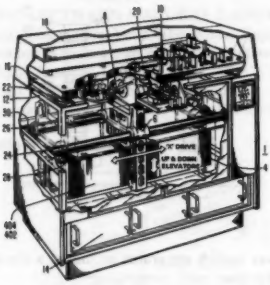
U.S. Cl. 369—34 **12 Claims**

1. In a data processing system for use with a disc-shaped record medium, the data processing system including a storage module having a plurality of storage locations for storing record media and a user station for recording information on

and playing back information from a recording surface of said record medium, an apparatus comprising:

transporting means for transporting said record media from said storage module to an incoming position proximate said user station and from an outgoing position proximate said user station to said storage module, said transporting means including a first transfer means for transferring a selected record medium from a storage location of said storage module to said incoming position and a second transfer means for transferring said selected record medium from said outgoing position to a storage location of said storage module;

means for conveying said selected record medium from said incoming position to said user station, said conveying means including attachment means for holding said selected record medium while said selected record medium is conveyed from said incoming position to said user station;



ejector means for transferring said selected record medium from said user station to said outgoing position; and

alignment means for aligning said selected record medium as said selected record medium is conveyed from said incoming position to said user station, said alignment means including spring means for maintaining said selected record medium in said incoming position while said attachment means engages said selected record medium and for releasing said selected record medium from said incoming position while said conveying means conveys said selected record medium to said user station, said alignment means aligning said selected record medium as said ejector means transfers said selected record medium from said user station to said outgoing position, said spring means preventing said record medium from being transferred into said incoming position from said outgoing position.

4,502,134

OPTICAL DISC SIGNAL REPRODUCING SYSTEM WITH TILT IMMUNIZATION

Mitsushige Kondo; Kazuo Okada, and Kazuo Hirasawa, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

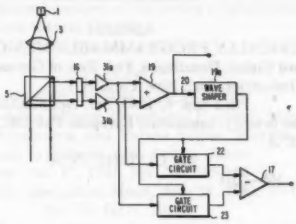
Filed Jun. 30, 1982, Ser. No. 393,944

Claims priority, application Japan, Jul. 16, 1981, 56-111630

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—46 **5 Claims**

1. An optical signal reproducing system comprising a record disc (11) having alternating pits (13) and lands in a surface thereof defining an information recording track (12), a light source (1), a collimating lens (9) for focusing light from said source to form a light spot (10) on said record disc, a dual optical detector (16) for converting light bearing information reflected from said disc into electrical signals, summing amplifier means (19) for adding outputs of said dual optical detector, a differential amplifier (17) for producing a differential output from signals received from said dual optical detector, and means (15) responsive to said differential output for controlling the position of said light spot in a direction transverse to said recording track, characterized by: means operatively coupled between an output of said summing amplifier means and said differential amplifier for constraining the output of said differ-



ential amplifier to contain only signals derived from light reflected from pits on said record disc, whereby erroneous disc tilt induced lateral tracking offset corrections due to light reflected from lands on said record disc are avoided.

4,502,135

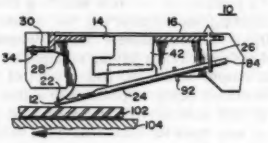
PICKUP CARTRIDGE HAVING IMPROVED STYLUS FLYLEAD

Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1983, Ser. No. 543,718

Int. Cl.³ G11B *3/50*

U.S. Cl. 369—170 **7 Claims**



1. A protective cartridge for housing a pickup stylus including an electrode adapted for recovering prerecorded information from a disc record; said protective cartridge comprising:

(A) a compliant stylus holder for supporting said pickup stylus;

(B) a stylus arm having said compliant stylus holder disposed at one end thereof, and having its other end yieldably supported in said cartridge;

(C) a stylus flylead, separate from said stylus holder, for electrically connecting said stylus electrode to a terminal disposed on said cartridge; and

(D) means for damping said stylus flylead consisting of a coating of damping material disposed on said flylead.

4,502,136

APPARATUS FOR CENTERING AND CLAMPING AN INFORMATION RECORDING DISK IN A DATA STORAGE DEVICE

David W. Rickert; Richard A. Wilkinson, Jr., both of Boulder, and William C. Hunt, Lafayette, all of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Apr. 4, 1983, Ser. No. 481,963

Int. Cl.³ G11B *9/06, 19/20*

U.S. Cl. 369—271 **4 Claims**

1. An apparatus for the accurate centering and clamping of an information recording disk in an information recording device, comprising:

an information recording disk;

a disk support assembly, said disk support assembly having,

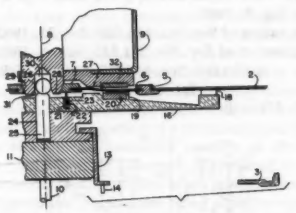
a disk support hub, said disk support hub having a means for receiving a first disk support assembly clamping means, and

a disk support platter, said disk support platter attached to the disk support hub, said disk support platter having a first, raised circular rim located upon the upper outer surface of said disk support platter and supporting the middle portion of the disk, further having a second, raised circular rim located upon the upper inner surface of the disk support platter and supporting the inner portion of the disk, further having a disk centering means;

a disk rotating means, said disk rotating means having a rotating spindle, said spindle having a bottom facing surface for the mounting of the disk, said bottom surface having a downward projecting neck, said neck having a tapered outer surface to accept an inner taper of a centering collar of the disk, and said spindle neck further having a cylindrical passage, said passage having a tapered lower rim to closely accept a centering stem of a disk centering assembly;

a disk elevator assembly, said disk elevator assembly raising the disk and the disk support assembly until the disk is centered and clamped onto the disk rotating means, said disk elevator assembly thereafter retracting so as to disengage from the disk support assembly, thereby allowing free rotation of the disk and the disk support assembly with the disk rotating means, the disk elevator assembly remaining stationary;

a disk centering assembly, said assembly having



a centering stem, said centering stem having a ball-shaped upper portion and wherein the lower portion of the centering stem is closely seated in a first opening in the disk support platter and disk support hub for that purpose,

at least three plunger and spring assemblies, each assembly mounted in one of a set of at least three equally spaced plunger holes in the disk support platter surface said plunger holes for the purpose of accepting the plunger and spring assemblies, said plunger and spring assemblies arranged in the plunger holes such that the springs cause the plungers to be pushed to a fully extended, upward position,

a flexible spacer ring, having the outside edge of said flexible spacer ring fixed to the inner edge of the disk, said disk having an opening for the attachment of said flexible spacer ring, said flexible spacer ring also having an inner opening for attachment of a disk centering collar, and;

a disk centering collar, the outer edge of which is fixed to the inner opening in the flexible spacer ring, said disk centering collar also having an interior opening, said interior opening having a taper to allow said flexible spacer ring interior opening to closely fit the tapered outer surface of the spindle neck such that the plunger contacts and causes the flexible spacer ring to flex upward, allowing the disk centering collar to contact the outer tapered surface of the spindle neck prior to the disk contacting the bottom surface of the spindle;

a first, disk support assembly clamping means, said disk support assembly clamping means selectively clamping the disk support assembly to the disk elevator assembly during disk centering, clamping and unclamping operations, but releasing the disk support assembly to rotate with the disk rotating means during device operation, and;

a second, disk clamping means, said means selectively clamping the disk between the disk support assembly and the spindle,

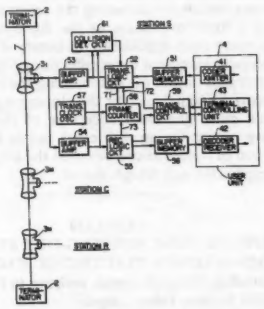
such that, as the disk elevator assembly raises the disk and disk support means toward the spindle where the centering stem contacts the lower rim of the cylindrical passage of the spindle neck, the centering stem and the cylindrical passage cooperating to cause the initial centering of the disk and disk support means with respect to the spindle, and as the disk and disk centering means continues upwards, the inner taper of the centering collar contacts the outer tapered surface on the spindle neck, causing the disk to move laterally for precise centering of the disk with respect to the spindle.

4,502,137

DIGITAL SIGNAL TRANSMITTING METHOD

Yoichi Tan, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,011
Claims priority, application Japan, Mar. 19, 1981, 56-38714
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—85 **9 Claims**



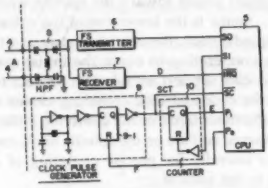
1. In a multipoint communication network wherein a plurality of taps are disposed at arbitrary positions on a communicating cable whose end-to-end signal propagation time is long relative to a bit period, personal stations are connected to said communicating cable through said taps, and transmission and reception of digital signals are performed, a digital signal transmitting method comprising the steps of

determining at each of said stations the timing of a repeatable frame, said frame being subdivided into a plurality of successive blocks, and transmitting packets of information from said stations to said cable during blocks selected and monopolized by said stations to provide time division multiplexed signals on said cable, said determination based on already transmitted packets of information received by said stations and if no packets are being received said determination being set by the first station to transmit a packet.

4,502,138
SYNCHRONIZATION SYSTEM FOR KEY TELEPHONE SYSTEM

Akiho Doi, and Norio Saneyoshi, both of Tokyo, Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,333
Claims priority, application Japan, Aug. 3, 1981, 56-120685
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 6 Claims

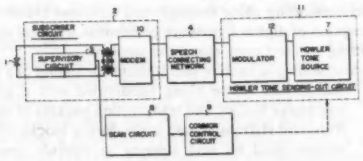


1. In a key telephone systems having a key service unit, a plurality of key telephone sets, intercom lines connecting the key telephone sets and the key service unit, the improvement which comprises, a synchronizing system in each key telephone set for synchronizing signal transmissions from the corresponding individual key telephone sets to the key service unit with transmissions from the key service unit, the synchronizing system in each key telephone set comprising means for receiving a multiplex transmission from the key service unit having a multiplexed frequency shift signal as a control signal and a voice signal, the control signal including control transmission data from the key service unit to the synchronizing system including a start bit following a fixed number of signals having a binary state opposite to a binary state of the start bit, means for removing the voice signal from the multiplex transmission received from the key service unit, means for converting the received frequency shift signal free of the voice signal to the transmission data control signal with the control transmission data, means for detecting the reception of the start bit following a fixed succession of the fixed number of signals having a binary state opposite to the binary state of the start bit and developing an output upon detection of the start bit, means receptive of said output for determining the received output is a synchronizing signal and for developing a reset pulse, and a shift clock pulse generator receptive of the reset pulse for developing output timing shift clock pulses for effecting synchronization of transmissions between the key service unit and the corresponding key telephone set.

4,502,139
HOWLER TONE SENDING-OUT SYSTEM IN TIME-DIVISION ELECTRONIC EXCHANGES

Teruo Matsufuji, Koganei, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,189
Claims priority, application Japan, Feb. 12, 1981, 56-19544
Int. Cl.³ H04J 3/12
U.S. Cl. 370—110.2 2 Claims

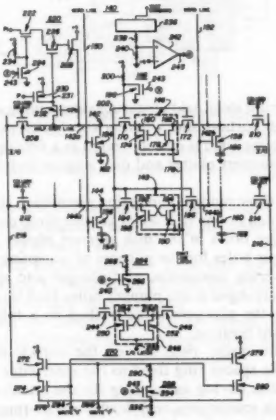


1. In a time-division telephone switching system, a subscriber circuit having a time-division demodulator and a supervisory circuit connected to a telephone set for supervision of incoming calls, call-answering, line-busy and on-hook supervision, on said telephone set, a common control circuit for receiving on-hook status signals from the supervisory circuit representative of the off-hook state of the telephone set if the subscriber of the corresponding telephone set has not correctly replaced the handset of the telephone set after a call, a scan circuit connected to the supervisory circuit and to the control circuit for applying on-hook status signals to the control circuit, a howler tone sending-out circuit connected to receive signals from the common control circuit and having a howler tone source for transmission of a howler tone signal to the demodulator for conversion to a howler tone audible signal indicating the handset of the telephone set is not correctly replaced, a time-division modulator in said howler tone sending-out circuit for modulating the howler tone signal for time-division transmission thereof, a time-division speech connecting network for time-division transmission of speech signals between, from and to said telephone set and connected for time-division transmission of the modulated howler tone signal to the telephone set, the time-division demodulator connected in the subscriber circuit for time-division demodulating the modulated howler tone signal and applying the howler tone signal to the telephone set for conversion to said howler tone audible signal.

4,502,140
GO/NO GO MARGIN TEST CIRCUIT FOR SEMICONDUCTOR MEMORY

Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01150, § 371 Date Sep. 8, 1980, § 102(e) Date Sep. 8, 1980
Continuation of Ser. No. 516,865, Jul. 25, 1983, , which is a continuation of Ser. No. 251,533, Sep. 8, 1980,. This PCT application Sep. 8, 1980, Ser. No. 599,208
Int. Cl.³ G01R 31/28
U.S. Cl. 371—28 18 Claims



1. A margin testing circuit for a semiconductor memory having a plurality of memory cells in which first and second states are normally stored therein to represent binary data, the testing circuit comprising elements integral with said memory including:

means for receiving a test command,

means for generating a fixed test state in response to receiving said test command, said test state having an amplitude between said first and said second states when said semiconductor memory is operated with normal power supply voltage levels, and

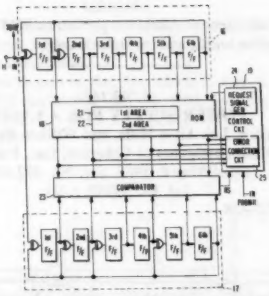
means for storing said test state in at least one of said memory cells.

4,502,141

CIRCUIT FOR CHECKING BIT ERRORS IN A RECEIVED BCH CODE SUCCESSION BY THE USE OF PRIMITIVE AND NON-PRIMITIVE POLYNOMIALS

Takakuni Kuki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,873
Claims priority, application Japan, Sep. 11, 1981, 56-144526
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **3 Claims**



1. An error checking circuit responsive to an input succession of bit sequences for checking bit errors in said input succession by deciding whether each bit sequence includes a single error or a t-tuple error where t represents an integer which is greater than unity, said single error being present at a bit location in said each bit sequence, each of said bit sequences being determined by a combination of a predetermined number of information bits and a preselected number of check bits generated by a predetermined generator polynomial to ensure a minimum intercode distance which is not less than four, said predetermined generator polynomial being equal to a product of factors comprising a primitive and a non-primitive polynomial, said error checking circuit comprising:

first dividing means for successively dividing the individual bit sequences by said primitive polynomial to calculate first residues, respectively, and to produce first residue signals representative of the respective first residues, the first residues calculated when the single errors are present in the bit sequences divided by said primitive polynomial, respectively, becoming first non-zero residues, respectively, said first non-zero residues being unique with respect to the bit locations at which the last-mentioned single errors are present, respectively;

second dividing means for successively dividing the individual bit sequences by said non-primitive polynomial to calculate second residues, respectively, and to produce second residue signals representative of the respective second residues, the second residues calculated in whichever of a first case where the bit sequences divided by said non-primitive polynomial include the single errors, respectively, and a second case where the bit sequences divided by said non-primitive polynomial include the t-tuple errors, respectively, becoming second special residues, respectively;

memorizing means for memorizing a plurality of reference signals representative of reference numbers, respectively, said reference numbers being in one-to-one correspondence to said first non-zero residues and being identical with those of said second special residues which would be calculated by said second dividing means only in said first case;

accessing means responsive to said first residue signals for accessing said memorizing means to make said memorizing means produce said reference signals as output reference signals, respectively, when the first residue signals responsive to which said memorizing means is accessed represent said first non-zero residues, respectively, the output reference signal produced when the first residue signal responsive to which said memorizing means is accessed represents one of said first non-zero residues being representative of the reference number which is in one-to-one correspondence to said one of the first non-zero residues;

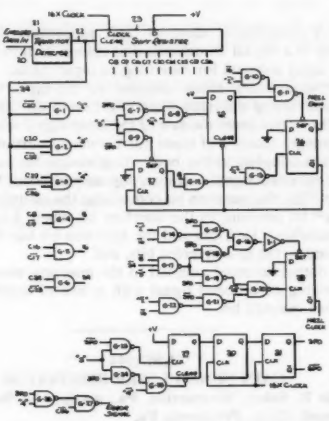
comparing means for comparing the second residue signal produced when each bit sequence is divided by said non-primitive polynomial with the output reference signal produced in response to the first residue signal produced when the last-mentioned bit sequence is divided by said primitive polynomial, said comparing means thereby producing a result signal representative of presence of a single and a t-tuple error in the last-mentioned bit sequence when the reference number represented by the last-mentioned output reference signal is in one-to-one correspondence to the first non-zero residue represented by the last-mentioned first residue signal and is not, respectively.

4,502,142

APPARATUS FOR DETECTING ERRORS IN A DIGITAL DATA STREAM ENCODED IN A DOUBLE DENSITY CODE

Ladislao C. Csengery, Woodbridge, N.J., assignor to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed Sep. 7, 1982, Ser. No. 415,695
Int. Cl.³ H03K *13/24, 13/32*
U.S. Cl. 371—55 **7 Claims**



1. A real-time error detection system for double density Miller or similarly encoded binary data wherein, during decoding of the waveform containing said data, signals are generated indicative of the intervals between successive transitions of said waveform, which intervals for an error-free waveform are of short, intermediate or long duration related in the ratio of 2:3:4, said error detection system comprising in combination first means for providing said signals indicative of the interval between successive transitions of a waveform, second means for applying a waveform to be decoded to said first means, thrid means having a first and second operable state, said third means having an input coupled to an output of said first means which contains said signals indicative of an intermediate interval for responding to each of said signals indicative of an intermediate interval by alternating between said states, said third means also having an input coupled to an output of said

first means which contains said signals indicative of a long interval for responding to each of said signals indicative of a long interval by assuming said first operable state, and fourth means coupled to outputs of said first and third means for providing an error signal each time said third means is in said second state when said first means provides a signal indicative of a long interval.

4,502,143

CONSECUTIVE IDENTICAL DIGIT SUPPRESSION SYSTEM IN A DIGITAL COMMUNICATION SYSTEM

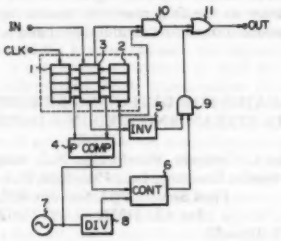
Masami Kato, Tokyo, and Noriaki Yoshikai, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,838

Claims priority, application Japan, Apr. 20, 1981, 56-59944; Dec. 25, 1981, 56-209103; Dec. 28, 1981, 56-209993; Dec. 28, 1981, 56-209994

Int. Cl.³ H03K *5/26*

U.S. Cl. 371—57 **9 Claims**



1. A consecutive identical digit suppression bit insertion system in a digital communication system comprising;

an input terminal for receiving an input signal,

rate converting means coupled to the input terminal for converting the transmission bit rate of the input signal to $(m+1)/m$ times the rate of the input signal where m is the integer number of input bits between insertion bits,

means coupled to the converting means for receiving the converted signal and inserting an additional bit after the m^{th} bit, the insertion bit comprising the complement of the k^{th} bit previous to the insertion bit where k is an integer satisfying $1<k<m$ and the insertion bit has the same bit rate as the m converted bits, and

an output terminal coupled to the inserting means for providing an encoded signal with m bits of input signal and one inserted bit.

4,502,144

GAIN TUNED LASER RESONATOR

Dennis R. Suhre, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1982, Ser. No. 387,299

Int. Cl.³ H01S *3/10*

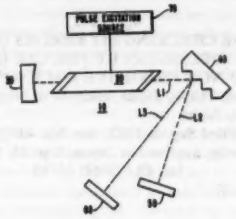
U.S. Cl. 372—23 **3 Claims**

1. In a laser apparatus having a single laser gain medium and operating in a pulsed mode, the combination of:

optical elements disposed relative to said single laser gain medium to produce two or more wavelengths from said single laser gain medium,

said optical elements including first and second mirror means, and a grating element, said first mirror means being a totally reflecting mirror, said second mirror means being two or more partially reflecting mirrors, said grating element cooperating with said first mirror means through said single laser gain medium to define separate optical paths between said first and second mirror means, each path corresponding to a separate wavelength;

said partially reflecting mirrors being positioned with respect to said grating element to establish path lengths for the optical paths of the respective wavelengths such that



each wavelength exhibits a predetermined temporal spacing, pulse width and/or pulse energy.

4,502,145

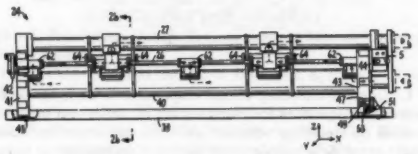
POWER SUPPLY FOR A LASER

Peter N. Allen, Los Altos Hills, and William Blake, Palo Alto, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed May 6, 1983, Ser. No. 492,496

Int. Cl.³ H01S *3/00*

U.S. Cl. 372—38 **10 Claims**



1. In a gas laser of the type having a gas discharge tube containing a gas lasing medium, a power supply for operating said laser in a continuous mode, wherein said power supply having three leads for connecting to a three phase power source, said leads being connected to a plurality of primary coils; a plurality of secondary coils; and a transformer means for increasing the voltage from the power source through the primary coils to the secondary coils, wherein the improvement comprising:

means for generating magnetic flux asymmetry in said transformer means;

whereby said magnetic flux asymmetry causes said laser to operate in a pulsing mode.

4,502,146

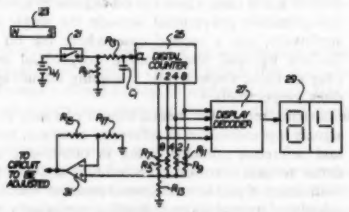
ADJUSTMENT OF ELECTRONIC SKI BINDING CIRCUITRY

Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13088

Filed Feb. 25, 1982, Ser. No. 352,385

Int. Cl.³ H03K *17/945, 17/95*

U.S. Cl. 377—2 **24 Claims**



1. A proximity adjustment means for generating electrical control signals to adjust an electrical value within inaccessible

electrical circuitry in response to the presence of a proximity stimulus, said proximity adjustment means comprising:

proximity stimulus response means for producing an electrical response to the presence of the proximity stimulus within its vicinity,

isolating means for isolating said proximity stimulus response means from the proximity stimulus, and

transducing means operatively connected to said proximity stimulus response means, said transducing means including accumulating means for generating digital signals of increasing or decreasing cumulative value corresponding to the electrical responses produced by said proximity stimulus response means to produce said electrical control signals for said proximity adjustment.

4,502,147

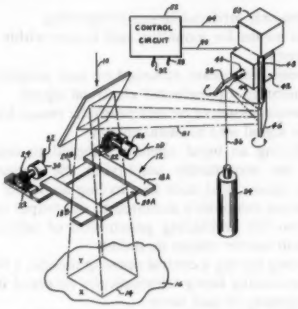
MEANS FOR VISUALLY INDICATING AN X-RAY FIELD

Terry J. Michaels, Milwaukee, Wis., assignor to Charles Lescrenier, Milwaukee, Wis.

Continuation-in-part of Ser. No. 406,217, Aug. 9, 1982, abandoned. This application Jan. 18, 1984, Ser. No. 572,169

Int. Cl.[3] **A61B** *6/08; G21F 5/04*

U.S. Cl. 378—206 **20 Claims**



1. Apparatus for providing a visual indication in the field produced by an X-ray beam having a mirror on the axis thereof for reflecting a light beam onto the field, said apparatus comprising:

a light source generating a light beam along a path;

a first means for receiving said beam and for deflecting same at an angle to said path, said first deflection means being responsive to a first signal for arcuately moving the light beam;

a second means for receiving the beam of light deflected by said first deflection means and for futher deflecting same to apply said light beam to the mirror in the X-ray beam for reflection onto the field, said second deflection means being responsive to a second signal to arcuately move the light beam; and

signal generating means for generating the first and second signals for energizing said first and second deflection means to move the light beam about the field to provide the visual indication.

4,502,148

FM STEREO DEMODULATOR FOR DEMODULATING STEREO SIGNALS DIRECTLY FROM AN FM INTERMEDIATE FREQUENCY SIGNAL

Kohji Ishida; Tadashi Noguchi, and Tatsuo Numata, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,129

Claims priority, application Japan, Jun. 26, 1981, 56-99922; Jun. 26, 1981, 56-99924

Int. Cl.[3] **H04H** *5/00*

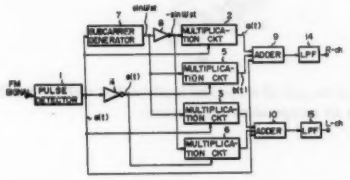
U.S. Cl. 381—7 **4 Claims**

1. An FM stereo demodulator for reproducing a first channel signal and a second channel signal from an FM intermediate frequency signal; said demodulator comprising:

a pulse signal generating means for generating, from said FM intermediate frequency signal, a first pulse train signal and a second pulse train signal each having a constant pulse width and spectrum components corresponding to a stereo composite signal component of said FM intermediate frequency signal, said second pulse train signal being opposite in phase relative to said first pulse train signal;

a subcarrier signal generating means responsive to one of said first and second pulse train signals, for selectively detecting a pilot signal component included in said one of first and second pulse train signals to generate a first sinusoidal subcarrier signal in phase with said pilot signal and a second sinusoidal subcarrier signal opposite in phase with said pilot signal;

a first multiplication means for multiplying said first pulse train signal by said second sinusoidal subcarrier signal;



a second multiplication means for multiplying said second pulse train signal by said first sinusoidal subcarrier signal;

a third multiplication means for multiplying said first pulse train signal by said first sinusoidal subcarrier signal;

a fourth multiplication means for multiplying said second pulse train signal by said second sinusoidal subcarrier signal;

a first mixer means for additively mixing an output signal of said first multiplication means with an output signal of said second multiplication means to produce said first channel signal; and

a second mixer means for additively mixing an output signal of said third multiplication means with an output signal of said fourth multiplication means to produce said second channel signal.

4,502,149

MULTI-PURPOSE INTERCHANGEABLE MODULAR AUTO LOUDSPEAKER SYSTEM

Herbert I. Gefvert, 495 S. Green Bay Rd., Lake Forest, Ill. 60045

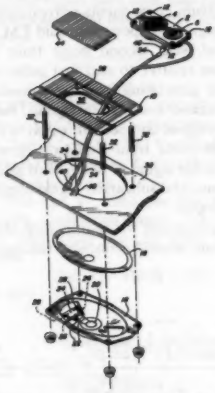
Filed Feb. 11, 1982, Ser. No. 347,820

Int. Cl.[3] **H04R** *5/02*

U.S. Cl. 381—24 **5 Claims**

1. A loudspeaker system for use in a motor vehicle comprising a first module having a lower-frequency transducer, a grille covering said first module, said grille having a receptacle coaxially positioned above said lower-frequency transducer, and a second module having at least one higher-frequency transducer, said second module being adapted to be removably

accommodated in said receptacle, whereby said second module is adapted to operate either while accommodated in said



receptacle as part of a co-axial loudspeaker system, or, alternatively as an independent loudspeaker.

4,502,150

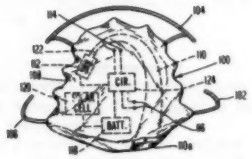
ARTIFICIAL LARYNX

Philip Katz, Princeton Junction; Henry S. Brenman, Cinnaminson, both of N.J.; Louis D. Lowry, Villanova, and Harold Schwartz, King of Prussia, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 249,140, Mar. 30, 1981, Pat. No. 4,473,905. This application Sep. 30, 1982, Ser. No. 428,848

Int. Cl.³ A61F *1/20*

U.S. Cl. 381—70 **4 Claims**



1. An intraoral artificial larynx, comprising:

(a) prosthetic means for mounting said larynx within the oral cavity;

(b) a power source mounted on said prosthetic means;

(c) signal generation means mounted on said prosthetic means for generating a preselected electrical signal;

(d) speaker means mounted on said prosthetic means for converting said signal into acoustic energy; and

(e) a tongue activatable intraoral switch mounted on said prosthetic means; said switch comprising a contact for completing a ground path of said larynx through the tongue.

4,502,151

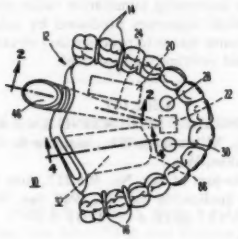
REPLACEABLE SALIVA BARRIER FOR INTRA-ORAL LARYNX

Craig A. Castle, Ponte Verdra Beach; Jon M. Benson, and Theodore H. Toch, both of Jacksonville, Fla., assignors to Xomed, Inc., Jacksonville, Fla.

Filed Nov. 1, 1983, Ser. No. 547,772

Int. Cl.³ A61F *1/20*

U.S. Cl. 381—70 **6 Claims**



1. An intra-oral artificial larynx comprising:

prosthetic means for mounting said larynx within the intra-oral cavity;

signal generation means mounted on said prosthetic means for generating a preselected electrical signal;

speaker means mounted on said proshetic means for converting said signal into acoustic energy;

a horn having an input opening coupled to said speaker means for acoustically amplifying the output of said speaker means, said horn also having an output opening;

barrier means removably mounted to the output opening of said horn for precluding penetration of saliva into the horn; said barrier means including

a mounting having a central opening therein, a first end of said mounting being telescopically received in the output opening of said horn;

a second end having a mouth, said second end being formed on a bias to the longitudinal axis of said mounting whereby said mouth is elliptical in cross-section when viewed in a direction normal to the mouth, said mounting being rotatable with respect to said horn, whereby the orientation of said mouth with respect to said prosthetic means may be selectively varied; and

a microporous membrane sealing said mouth;

a tongue activated switching means enabling said signal generation means and said speaker means; and

a power source for said signal generation means and said speaker means.

4,502,152

LOW CURRENT LINEAR/HIGH CURRENT CHOPPER VOLTAGE REGULATOR

Walter Sinclair, Westoning, England, assignor to Lucas Industries Limited

Continuation of Ser. No. 64,643, Aug. 7, 1979, abandoned. This application Jan. 17, 1984, Ser. No. 571,133

Claims priority, application United Kingdom, Aug. 16, 1978, 33540/78

Int. Cl.³ H04B *1/40*; G05F *1/58*

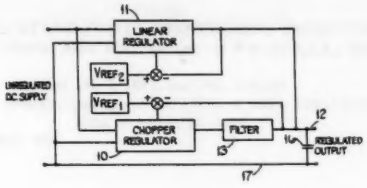
U.S. Cl. 455—73 **9 Claims**

1. A power supply circuit in combination with a transmitter/receiver system, said system having a current drain when operable in a transmit mode and also having a current drain when operable in a receive mode, said power supply circuit comprising:

linear voltage regulator means, connected to said supply voltage and providing a first voltage output, for regulating said voltage output to a first reference voltage, said linear voltage regulator means having a current voltage

characteristic such that said output voltage falls below a second reference voltage when current through said linear voltage regulator means increases above a predetermined level, wherein said predetermined level is greater than said current drain of said transmitter/receiver operating in said receive mode and less than the current drain of said transmitter/receiver operating in said transmit mode;

chopper voltage regulator means connected to said supply voltage and providing a second voltage output, for regulating said chopper voltage regulator means output to said

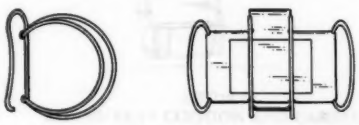


second reference voltage, said second voltage is of less absolute magnitude than said first reference voltage; and means for interconnecting said regulator means outputs.

DESIGNS

FEBRUARY 26, 1985

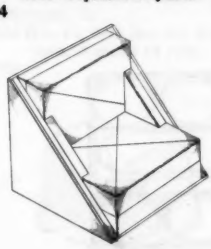
277,709
BELT MOUNTED BALL CARRIER
William Toriumi, 41079 Pajaro Dr., Fremont, Calif. 94538
Filed Aug. 27, 1982, Ser. No. 412,153
Term of patent 14 years
U.S. Cl. D2—400



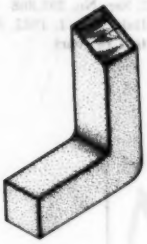
277,710
KEY HOLDER FOR A PURSE
Richard A. Engle, and Angeline V. Engle, both of 7594 12 Mile Rd., Warren, Mich. 48092
Filed Mar. 24, 1982, Ser. No. 361,417
Term of patent 14 years
U.S. Cl. D3—54

277,711
DISPLAY STAND FOR CONFECTIONERY PRODUCTS
Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy
Filed Jul. 7, 1982, Ser. No. 395,868
Claims priority, application Italy, Feb. 1, 1982, 52860/82[U]
Term of patent 14 years
U.S. Cl. D6—464

277,712
CHAIR
Derek W. Dutton, 50 Catalpa Dr., Atherton, Calif. 94025, and Katherine W. De Foyd, 108 Bush St., Ashland, Oreg. 97520
Filed Jan. 3, 1983, Ser. No. 455,063
Term of patent 14 years
U.S. Cl. D6—334

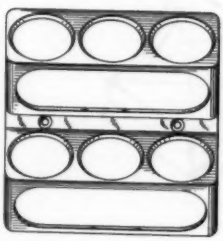


277,713
JEWELRY DISPLAY PROP
Dennis Crawford, Dallas, Tex., assignor to Bufkor, Inc., Buffalo, N.Y.
Filed Nov. 8, 1979, Ser. No. 92,367
Term of patent 14 years
U.S. Cl. D6—329



277,714
TOILET TISSUE ROLL COVER
Peggy Noble, 3604 Forest Hill Rd., Baltimore, Md. 21207
Filed Jan. 12, 1983, Ser. No. 457,428
Term of patent 14 years
U.S. Cl. D6—610

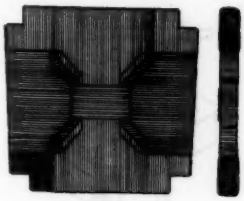
277,715
WALL MOUNTED HOLDER FOR REMOVABLE BINS
Edward D. Levy, Franklin Lakes, and Michael P. Ballone, New Providence, both of N.J., assignors to Gee Associates, Fort Lee, N.J.
Filed Sep. 29, 1982, Ser. No. 426,300
Term of patent 14 years
U.S. Cl. D6—571



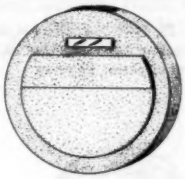
277,716
BOW AND ARROW RACK
Richard W. Galente, P.O. Box 111, Dover Plains, N.Y. 12522
Filed May 3, 1982, Ser. No. 374,182
Term of patent 14 years
U.S. Cl. D6—552

277,717
COMPUTER PRINTER STAND
David C. Petrick, Park Ridge, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.
Filed Sep. 3, 1982, Ser. No. 414,778
Term of patent 14 years
U.S. Cl. D6—495

277,718
WOVEN CHAIR SEAT
Sandra D. C. de Madaria, P.O. Box 1200, 89000 Tampico, Tamps, Mexico
Filed Dec. 1, 1982, Ser. No. 446,024
Term of patent 14 years
U.S. Cl. D6—502



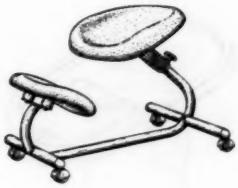
277,719
ROUND SEAT CUSHION AND CARRIER
Gregory C. Spaneas, 13 Exeter St., Danvers, Mass. 01923
Filed Sep. 30, 1982, Ser. No. 431,782
Term of patent 14 years
U.S. Cl. D6—596



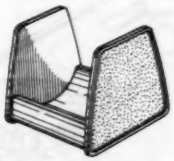
277,720
MIRROR
Heinz J. Leifert, Bad Essen, Fed. Rep. of Germany, assignor to Holz-Design Hofman & Schafer GmbH, Starnberg, Fed. Rep. of Germany
Filed Nov. 18, 1982, Ser. No. 442,511
Claims priority, application Fed. Rep. of Germany, May 21, 1982, 11 AR 1768/82
Term of patent 14 years
U.S. Cl. D6—306

277,721
COATHANGER HANDLE
David J. Jordan, 2505 W. Iola, Broken Arrow, Okla. 74012
Filed Sep. 22, 1982, Ser. No. 421,050
Term of patent 14 years
U.S. Cl. D6—328

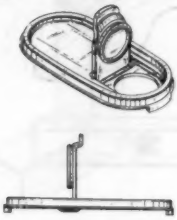
277,722
CHAIR
Svein A. Gusrud, Tokerudberget 18, N-Oslo 9, Norway
Filed Mar. 18, 1983, Ser. No. 476,614
Claims priority, application Norway, Sep. 28, 1982, 63303
Term of patent 14 years
U.S. Cl. D6—340

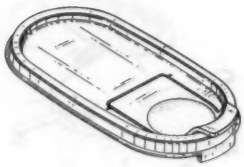


277,723
TUMBLER SEAL RACK OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Oct. 12, 1982, Ser. No. 433,949
Term of patent 14 years
U.S. Cl. D6—475

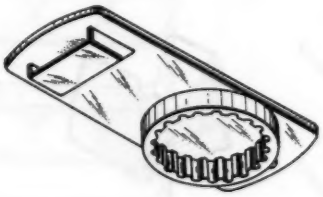


277,724
CONTAINER CLOSURE WITH CAPPED OPENING OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 13, 1982, Ser. No. 407,975
Term of patent 14 years
U.S. Cl. D7—392

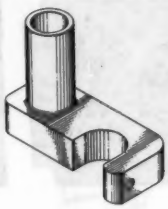




277,725
COMBINED BOTTLE AND CAN OPENER
Jerrold W. Silkebakken, 502 Lucia, Newport Beach, Calif. 92660, and Bruce H. Hale, 3861 Magnolia St., Irvine, Calif. 92710
Filed Mar. 4, 1983, Ser. No. 472,094
Term of patent 14 years
U.S. Cl. D8—40

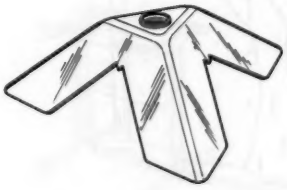


277,726
RISER STABILIZER FOR SPRINKLER SYSTEM PIPES
Cecil Galloway, Glendora, Calif., assignor to Brownline Pipe Inc., Pomona, Calif.
Filed Aug. 16, 1982, Ser. No. 408,270
Term of patent 14 years
U.S. Cl. D8—356



277,727
CONSTRUCTION JOINT
Dinko Klaric, 165 City Rd., South Melbourne, Victoria, Australia
Filed Nov. 23, 1982, Ser. No. 444,688
Claims priority, application Australia, May 26, 1982, 0517/82
Term of patent 14 years
U.S. Cl. D8—382

277,728
ANGLE FITTING
Frank Ahlund, Box 8069, 421 08 Vastra Frolunda, Sweden
Filed Jul. 27, 1982, Ser. No. 402,284
Claims priority, application Sweden, Feb. 4, 1982, 247/82
Term of patent 14 years
U.S. Cl. D8—400

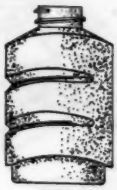


277,729
STIRRER FOR PAINTS OR THE LIKE
John Maxwell, Winlock, Wash., assignor to Ted E. Nickerson, Winlock, Wash.
Filed Sep. 7, 1982, Ser. No. 415,669
Term of patent 14 years
U.S. Cl. D8—14

277,730
COMBINED BOTTLE AND CAP
Serge Mansau, Neuilly sur Seine, France, assignor to American Cyanamid Company, Stamford, Conn.
Filed Jun. 18, 1982, Ser. No. 389,650
Claims priority, application France, May 27, 1982, 820110
Term of patent 14 years
U.S. Cl. D9—300

277,731
WINDHSIELD WASHER PUMP PACKAGE
Bernard C. Sharp, White Plains, N.Y., and Manuel Lopez, Trumbull, Conn., assignors to Parker Hannifin Corporation, Shelton, Conn.
Filed Jun. 30, 1982, Ser. No. 393,687
Term of patent 14 years
U.S. Cl. D9—337

277,732
BOTTLE
Milan Lang, Longueuil, Canada, assignor to Les Promotions Atlantiques, Inc., Lonqueuil, Canada
Filed Apr. 16, 1981, Ser. No. 254,910
Claims priority, application Canada, Feb. 26, 1981, D-26-02-81-4
Term of patent 14 years
U.S. Cl. D9—367



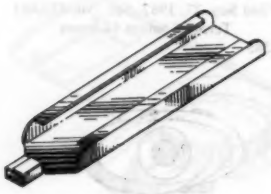
277,733
BOTTLE
Thomas B. Aldrich, III, Spring Valley, N.Y., and Albert H. Torongo, Jr., Yardley, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 12, 1982, Ser. No. 397,643
Term of patent 14 years
U.S. Cl. D9—376

277,734
COMBINED BOTTLE AND CAP
Ned Harris, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1982, Ser. No. 423,881
Term of patent 14 years
U.S. Cl. D9—385

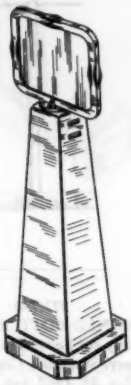
277,735
COMBINED BOTTLE AND CAP
Serge Mansau, Neuilly sur Seine, France, assignor to American Cyanamid Company, Stamford, Conn.
Filed Jun. 18, 1982, Ser. No. 389,811
Claims priority, application France, Jan. 15, 1982, 82.820110
Term of patent 14 years
U.S. Cl. D9—403

277,736
CONTAINER CAP
David F. Long, San Jose, Calif., assignor to Pacer Technology & Resources, Inc., Campbell, Calif.
Filed Sep. 20, 1982, Ser. No. 420,590
Term of patent 14 years
U.S. Cl. D9—443

277,737
ANTHURIUMS PACKING BOARD
Harold T. Tanouye, 279 Aipuni St., Hilo, Hi. 96720
Filed Jun. 14, 1982, Ser. No. 388,448
Term of patent 14 years
U.S. Cl. D9—456

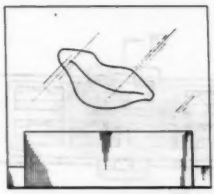


277,738
COMBINED ROAD MARKER AND LOCK-IN SIGN
Nick G. Grammas, Plymouth, and Michael T. Callas, Edina, both of Minn., assignors to Lamba Systems, Inc., St. Paul, Minn.
Filed Mar. 14, 1983, Ser. No. 475,079
Term of patent 14 years
U.S. Cl. D10—109



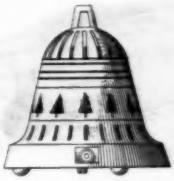
277,739
COMBINED ROAD MARKER AND FLASHING LIGHT
Nick G. Grammas, Plymouth, and Michael T. Callas, Edina, both of Minn., assignors to Lamba Systems, Inc., St. Paul, Minn.
Filed Mar. 14, 1983, Ser. No. 475,080
Term of patent 14 years
U.S. Cl. D10—109

277,740
LIPS DISPLAY
Harry L. Harmeson, 3726 Faculty Dr., Indianapolis, Ind. 46224
Filed Sep. 17, 1981, Ser. No. 303,095
Term of patent 14 years
U.S. Cl. D11—157

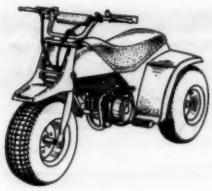


277,741
PENDANT
Tibor Arvai, 31, Avenue Princesse Grace, Monte Carlo, Monaco
Filed May 3, 1983, Ser. No. 491,211
Claims priority, application Switzerland, Nov. 4, 1982, DM001959
Term of patent 14 years
U.S. Cl. D11—79

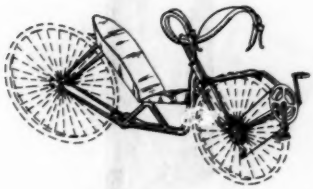
277,742
COMBINED SCENT DIFFUSER AND CHRISTMAS TREE ORNAMENT
Merril Hermanson, Palm Beach, Fla., assignor to Mr. Christmas Incorporated, New York, N.Y.
Filed Jun. 10, 1983, Ser. No. 502,911
Term of patent 14 years
U.S. Cl. D11—125



277,743
MOTORTRICYCLE
Hisashi Murakoshi, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed May 26, 1982, Ser. No. 382,302
Claims priority, application Japan, Dec. 11, 1981, 56-54842
Term of patent 14 years
U.S. Cl. D12—110



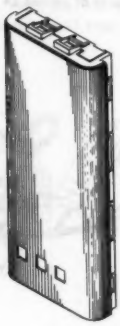
277,744
BICYCLE FRAME
Thomas D. Traylor, 22407 Warmside, Torrance, Calif. 90505
Filed May 3, 1982, Ser. No. 373,996
Term of patent 14 years
U.S. Cl. D12—111



277,745
BABY STROLLER
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Sep. 14, 1982, Ser. No. 417,955
Term of patent 14 years
U.S. Cl. D12—129

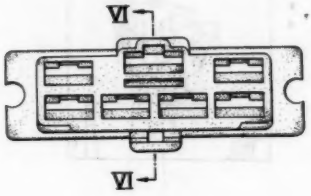
277,746
MUD GUARD FOR INSIDE OF WHEEL OF OFF-ROAD VEHICLE
Gary B. Hunsaker, 11015 Cozycroft, Chatsworth, Calif. 91311
Filed Jul. 21, 1982, Ser. No. 400,368
Term of patent 14 years
U.S. Cl. D12—184

277,747
BATTERY OR SIMILAR ARTICLE
Richard J. Toth, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 16, 1982, Ser. No. 408,353
Term of patent 14 years
U.S. Cl. D13—8

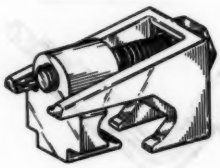


277,748
PINNED-EXTRUSION HEAT SINK FOR ELECTRONIC DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Anvid Engineering, Inc., Laconia, N.H.
Filed Sep. 30, 1982, Ser. No. 431,164
Term of patent 14 years
U.S. Cl. D13—23

277,749
ELECTRICAL CLAMP CONNECTOR
Jerald C. Todd, Birmingham, Ala., assignor to Square D Company, Palatine, Ill.
Filed Jul. 20, 1982, Ser. No. 400,204
Term of patent 14 years
U.S. Cl. D13—24

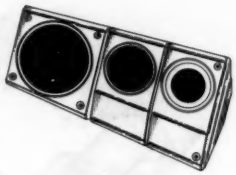


277,750
CONNECTOR HOUSING
Yoshio Ito, Yokkaichi, and Noriyuki Yoshida, Suzuka, both of Japan, assignors to Tokai Electric Wire Co., Ltd., Yokkaichi, Japan
Filed Aug. 31, 1982, Ser. No. 413,553
Claims priority, application Japan, Mar. 5, 1982, 57-9221
Term of patent 14 years
U.S. Cl. D13—24

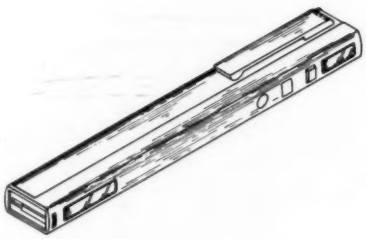


277,751
COMBINED TAPE RECORDER AND RADIO RECEIVER
Akio Ohno, Osaka; Kikuo Ohto, Nara; Takao Okada, Kyoto; Satsuki Yabunaka, and Benito Mishiro, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 12, 1982, Ser. No. 441,013
Term of patent 14 years
U.S. Cl. D14—5

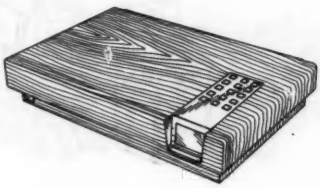
277,752
LOUDSPEAKER
Hitoshi Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 29, 1982, Ser. No. 444,914
Claims priority, application Japan, Jul. 2, 1982, 57-29921
Term of patent 14 years
U.S. Cl. D14—34



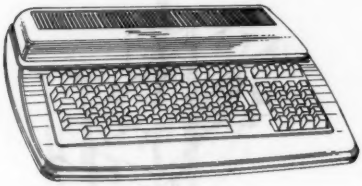
277,753
RADIO PAGER OR SIMILAR ARTICLE
John A. Eckmann, Baldwinsville, N.Y.; Donald K. Krumin, Ft. Lauderdale, Fla.; Richard J. Toth, Boca Raton, Fla., and William J. Scheid, Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 17, 1982, Ser. No. 419,292
Term of patent 14 years
U.S. Cl. D14—70



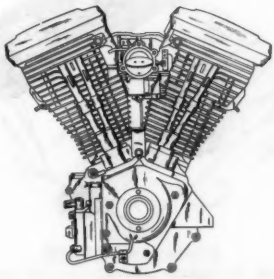
277,754
TELEVISION CONVERTER-DECODER
Robert W. Becker, Naperville, and David P. Chuboff, North Barrington, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Oct. 25, 1982, Ser. No. 437,418
Term of patent 14 years
U.S. Cl. D14—84

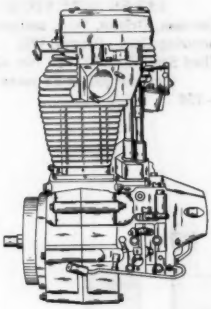


277,755
COMPUTER
Ira Velinsky, Plainfield, N.J., assignor to Commodore Electronics Limited, Wayne, Pa.
Filed Aug. 27, 1982, Ser. No. 412,309
Term of patent 14 years
U.S. Cl. D14—100

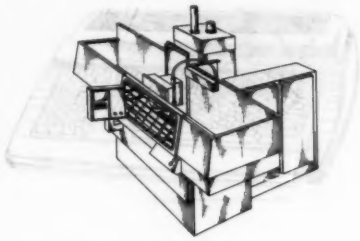


277,756
MOTORCYCLE ENGINE
William G. Davidson, Elm Grove, Wis., assignor to Harley-Davidson Motor Co., Inc, Milwaukee, Wis.
Filed Sep. 29, 1982, Ser. No. 428,284
Term of patent 14 years
U.S. Cl. D15—1

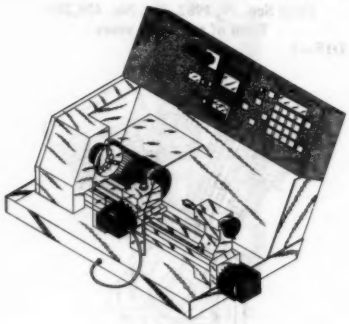




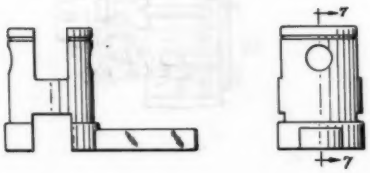
277,757
SURFACE GRINDING MACHINE
Raymond J. Guertin, East Greenwich; Chuhong Kang, North Kingston, and Peter P. Matthews, West Warwick, all of R.I., assignors to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Filed Sep. 7, 1982, Ser. No. 415,685
Term of patent 14 years
U.S. Cl. D15—124



277,758
NUMERICALLY CONTROLLED LATHE
Winfried Nemetz, Salzburg, Austria, assignor to Maier & Co., Salzburg, Austria
Filed Jun. 29, 1982, Ser. No. 393,524
Term of patent 14 years
U.S. Cl. D15—130



277,759
LEVER ACTUATOR
Douglas M. Coleman, Bristol, Wis., assignor to Coleman Tool and Manufacturing Corp., Bristol, Wis.
Filed Sep. 27, 1982, Ser. No. 423,508
Term of patent 14 years
U.S. Cl. D15—138



277,760
BALANCE MEASURING APPARATUS FOR MACHINERY
Louis D. Wilson, Folsom; Wesley G. Wilson, Sunnyvale, and Mark Vrilakas, West Sacramento, all of Calif., assignors to Drive Line Service, Incorporated, Sacramento, Calif.
Filed Sep. 27, 1982, Ser. No. 424,275
Term of patent 14 years
U.S. Cl. D15—138

277,761
AUTOMATIC CIRCUIT-PLATE ASSEMBLER
Vyacheslav V. Korovin, ulitsa Shekhurdina, 60, kv. 30; Vladimir Y. Kurganov, 3 proezd Stroitelei, 4, kv. 43; Bronislav I. Gulyaev, ulitsa Lebedeva-Kumacha, 72, kv. 168; Konstantin N. Shishkin, Knyazevsky vzvoz, 11/13, kv. 42, and Alexandr I. Kuryshev, ulitsa Vavilova, 32, kv. 1, all of Saratov, U.S.S.R.
Filed Aug. 27, 1981, Ser. No. 296,917
Term of patent 14 years
U.S. Cl. D15—144

277,762

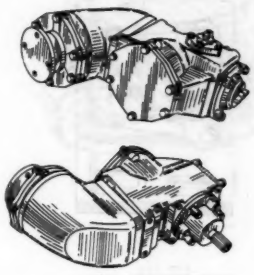
TRANSMISSION FOR BOATS

Kjell Borgersen, Hjalteby, and Lennart Brandt, Fjaras, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

Division of Ser. No. 105,242, Dec. 19, 1979, Pat. No. Des. 264,724. This application Sep. 14, 1981, Ser. No. 301,965

Term of patent 14 years

U.S. Cl. D15—149



277,763

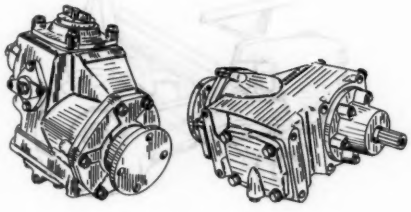
TRANSMISSION FOR BOATS

Kjell Borgersen, Hjalteby, and Lennart Brandt, Fjaras, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

Division of Ser. No. 105,242, Dec. 19, 1979, Pat. No. Des. 264,724. This application Sep. 14, 1981, Ser. No. 301,966

Term of patent 14 years

U.S. Cl. D15—149



277,764

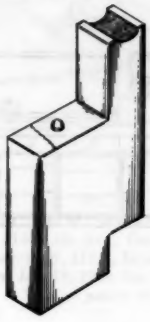
PIANO LID HEIGHT ADJUSTER BLOCK

Ted Henkle, 5415 Reynolds St., Savannah, Ga. 31405

Continuation-in-part of Ser. No. 244,198, Mar. 16, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,483

Term of patent 14 years

U.S. Cl. D17—9



277,765

GUITAR HEADSTOCK

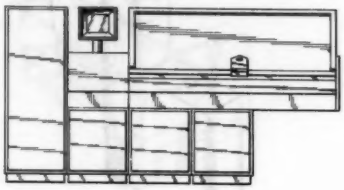
Masaaki Sugai, Fort Worth, Tex., assignor to Rhythm Band, Inc., Fort Worth, Tex.

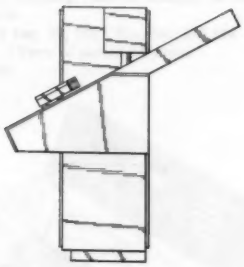
Filed Aug. 2, 1982, Ser. No. 404,533

Term of patent 14 years

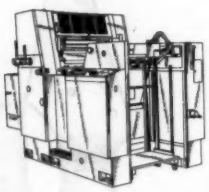
U.S. Cl. D17—20

277,766
APPARATUS FOR PRINTING AND PAPER PREPARATION
Alfred Schott, and Kurt Reichenberger, both of Radebeul, German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.
Filed Feb. 8, 1982, Ser. No. 346,912
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1981, 1400G-V2221
Term of patent 14 years
U.S. Cl. D18—13

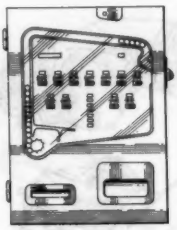




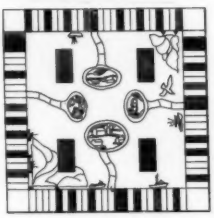
277,767
PRINTING MACHINE
Masakazu Sakamoto, Chiba; Shozo Tanibe, and Takashi Mimura, both of Hiroshima, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Sep. 28, 1982, Ser. No. 426,033
Claims priority, application Japan, Apr. 2, 1982, 57-14181
Term of patent 14 years
U.S. Cl. D18—13



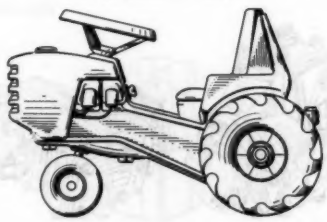
277,768
SLOT MACHINE
Martti I. Kärkkäinen, Espoo, and Lauri Martti, Helsinki, both of Finland, assignors to Raha-Automaattiyhdistys, Helsinki, Finland
Filed May 18, 1982, Ser. No. 379,310
Claims priority, application United Kingdom, Nov. 30, 1981, 1 003 901
Term of patent 14 years
U.S. Cl. D21—12



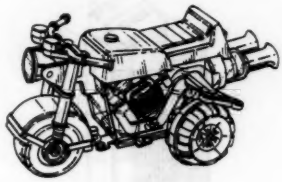
277,769
GAME BOARD
Ben Mabberley, Galiano Island, B.C., Canada (V0N 1P0), and Rennie Weatherell, Saturna Island, B.C., Canada V0N 2Y0
Filed Jul. 30, 1982, Ser. No. 403,562
Claims priority, application Canada, Jun. 14, 1982, 14-06-82-4
Term of patent 14 years
U.S. Cl. D21—25



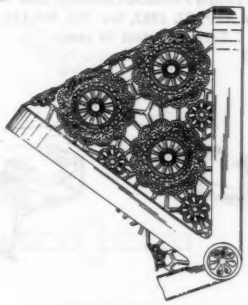
277,770
TOY TRACTOR
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Jan. 21, 1983, Ser. No. 459,779
Term of patent 14 years
U.S. Cl. D21—79



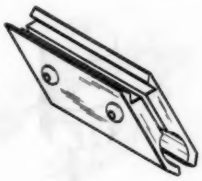
277,771
TOY MOTORCYCLE
Kazutaka Takeuchi, Yachiyo, Japan, assignor to Blue Box Toy Factory Limited, Hong Kong, Hong Kong
Filed Dec. 2, 1982, Ser. No. 446,146
Claims priority, application United Kingdom, Jul. 8, 1982, 1007604
Term of patent 14 years
U.S. Cl. D21—81



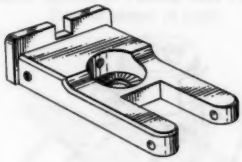
277,772
DOLL CARRIAGE
Susan A. Marsh, and George E. Schaefer, both of South Bend, Ind., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Jul. 8, 1981, Ser. No. 281,415
Term of patent 14 years
U.S. Cl. D21—134



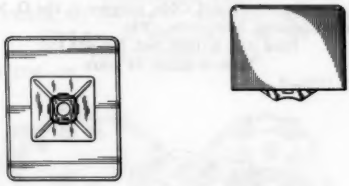
277,773
SCOPE MOUNT FOR A PELLET PISTOL OR THE LIKE
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Nov. 1, 1982, Ser. No. 438,021
Term of patent 14 years
U.S. Cl. D22—7



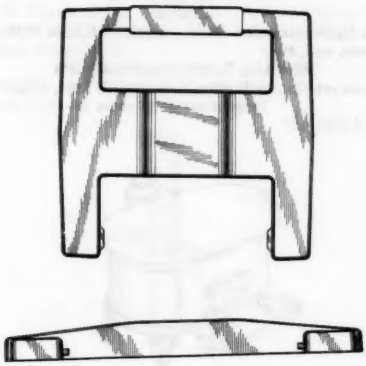
277,774
REAR GUNSIGHT
Mario F. Ruffino, 300 Beauregard Heights, Hampton, Va. 23669
Filed Sep. 7, 1982, Ser. No. 415,646
Term of patent 14 years
U.S. Cl. D22—8



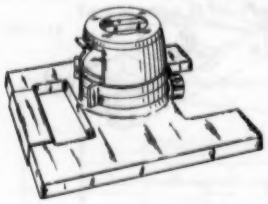
277,775
MAGNETIC FLUID CONDITIONER
John C. Moran, 3124 Lake Ave., Fort Wayne, Ind. 46805, and Gale M. Weisenbarger, 217 E. Israel St., Eaton, Ohio 45320
Filed Jan. 19, 1984, Ser. No. 572,117
Term of patent 14 years
U.S. Cl. D23—3



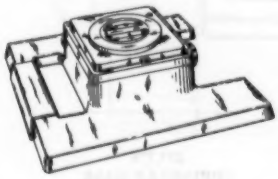
277,776
SPRINKLER BASE
Jack L. Lemkin, Cincinnati, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Oct. 4, 1982, Ser. No. 432,744
Claims priority, application Israel, Apr. 9, 1982, 8976
Term of patent 14 years
U.S. Cl. D23—7



277,777
SPRINKLER
Jack L. Lemkin, Cincinnati, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Apr. 8, 1983, Ser. No. 483,154
Term of patent 14 years
U.S. Cl. D23—7

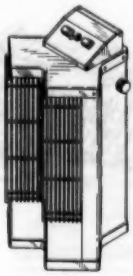


277,778
SPRINKLER
Jack L. Lemkin, Cincinnati, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Apr. 8, 1983, Ser. No. 483,155
Term of patent 14 years
U.S. Cl. D23—7



277,779
STOVE
Oreste G. Nosenzo, Asti, Italy, assignor to C.S. di NOSENZO Oreste, Asti, Italy
Filed Dec. 7, 1982, Ser. No. 447,551
Claims priority, application Italy, Apr. 3, 1981, 53080/81[U]
Term of patent 14 years
U.S. Cl. D23—97

277,780
SPACE HEATER
Paul V. Horst, Sr., Boulder; Charles D. Hoyt, Northglenn, and Joseph E. Velazquez, Englewood, all of Colo., assignors to Crockett & Kelly, Inc., Westminster, Colo.
Filed Oct. 13, 1982, Ser. No. 434,069
Term of patent 14 years
U.S. Cl. D23—122

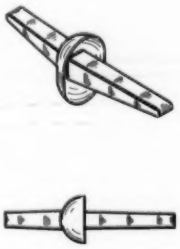


277,781
COMBINED FINGER CLIP AND CUP HOLDER FOR DENTAL CLEANING PASTE OR THE LIKE
Edward A. Weissenburger, Mercerville, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Mar. 22, 1982, Ser. No. 360,132
Term of patent 14 years
U.S. Cl. D24—10

277,782
AIRWAY AIRFLOW INDICATOR FOR FACILITATING BLIND NASAL OR BLIND ORAL INTUBATION OF THE TRACHEA AND THE LIKE
George P. Beck, P.O. Box 16385, Lubbock, Tex. 79470
Filed Aug. 10, 1982, Ser. No. 406,923
Term of patent 14 years
U.S. Cl. D24—17

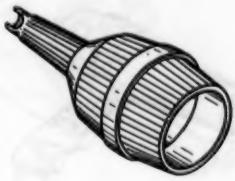
277,783
AIRWAY AIRFLOW INDICATOR FOR FACILITATING BLIND NASAL OR BLIND ORAL INTUBATION OF THE TRACHEA AND THE LIKE
George P. Beck, P.O. Box 16385, Lubbock, Tex. 79470
Filed Aug. 5, 1982, Ser. No. 406,383
Term of patent 14 years
U.S. Cl. D24—17

277,784
LESSER TOE METATARSAL PHALANGEAL IMPLANT
Thomas E. Sgarlato, Los Gatos, and James M. Christensen, San Diego, both of Calif., assignors to Sutter Biomedical, Inc., San Diego, Calif.
Filed Jun. 25, 1982, Ser. No. 392,360
Term of patent 14 years
U.S. Cl. D24—33



277,785
SURGICAL CLIP
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Sep. 30, 1982, Ser. No. 429,260
Term of patent 14 years
U.S. Cl. D24—27

277,786
STOPPER FOR PLASTIC OR GLASS TUBES FOR USE IN TAKING, TRANSPORTATION AND PRESERVING BACTERIOLOGICAL SAMPLES
Kosti T. Hellman, Espoo, and Lauri M. Sivonen, Helsinki, both of Finland, assignors to Orion-Yhtyma Oy., Helsinki, Finland
Filed Jun. 22, 1981, Ser. No. 276,121
Claims priority, application Finland, May 13, 1981, 366/81
Term of patent 14 years
U.S. Cl. D24—29

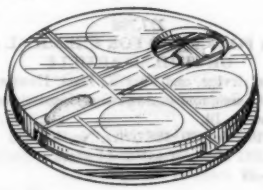


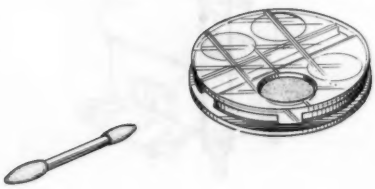
277,787
ELECTRODE CAP
Sue E. Corbett, 901 Harvard Pl., Woodland, Calif. 95695
Filed Aug. 26, 1982, Ser. No. 411,798
Term of patent 14 years
U.S. Cl. D24—34

277,788
CONTAINER FOR LIQUID FOR CHEMICAL ANALYSIS OR SIMILAR ARTICLE
Max D. Liston, Irvine, and Paul K. Hsei, Huntington Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Jul. 20, 1982, Ser. No. 400,103
Term of patent 14 years
U.S. Cl. D24—99

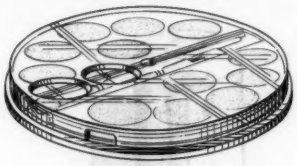
277,789
HAIR DRYER
Witold Pajak, Wayne, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Mar. 14, 1983, Ser. No. 476,022
Term of patent 14 years
U.S. Cl. D28—13

277,790
COSMETIC COMPACT
Eli I. Schefer, Sands Point, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Sep. 13, 1982, Ser. No. 416,799
Term of patent 14 years
U.S. Cl. D28—82

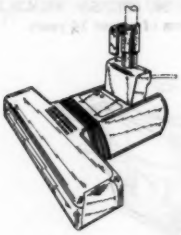




277,791
COSMETIC COMPACT
Eli I. Schefer, Sands Point, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Sep. 13, 1982, Ser. No. 416,803
Term of patent 14 years
U.S. Cl. D28—82

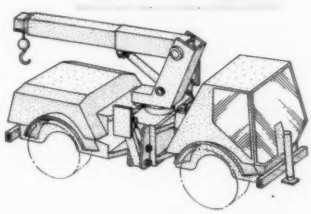


277,792
FLOOR CLEANER HEAD
Christoph Hoesch, Essen, Fed. Rep. of Germany, assignor to Vorwerk & Co Elektrowerke KG, Wuppertal, Fed. Rep. of Germany
Filed Jan. 25, 1982, Ser. No. 342,170
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 54 MR 14 534
Term of patent 14 years
U.S. Cl. D32—15

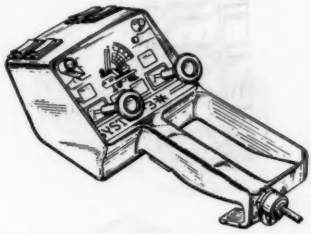


277,793
FOLDING SHOPPER'S CART
Katherine E. Allen, 741 Calle de los Amigos, Santa Barbara, Calif. 93105
Filed Aug. 5, 1982, Ser. No. 405,467
Term of patent 14 years
U.S. Cl. D34—17

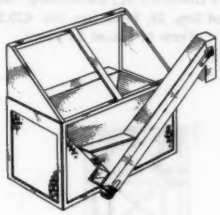
277,794
ARTICULATED MATERIAL HANDLING VEHICLE
Ralph C. Lanphere, Racine; Paul G. Nelson, Milwaukee, and Jerry A. Waite, Racine, all of Wis., assignors to J. I. Case Company, Racine, Wis.
Filed Mar. 12, 1982, Ser. No. 357,539
Term of patent 14 years
U.S. Cl. D34—34



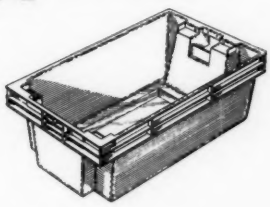
277,795
JOY STICK CONSOLE FOR REMOTE POSITION AND ENGINE CONTROL OF A CRANE OR THE LIKE
Edward E. Griffiths, 3200 Polaris St., #23, Las Vegas, Nev. 89102
Filed Jun. 8, 1981, Ser. No. 271,622
Term of patent 14 years
U.S. Cl. D34—35



277,796
HOPPER UNLOADER
Jay M. Teitelbaum, and Henry S. Teitelbaum, both of 3840 S. Jason St., Engelwood, Colo. 80110
Filed Feb. 18, 1982, Ser. No. 350,123
Term of patent 14 years
U.S. Cl. D34—29



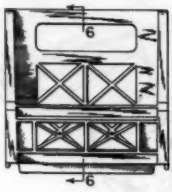
277,797
TOTE BOX
Jean-Marie Chabot, St-Damien, Canada, assignor to Les Industries Provinciales Ltée., St-Damien Bellechasse, Canada
Filed Aug. 30, 1982, Ser. No. 412,561
Term of patent 14 years
U.S. Cl. D34—40



277,798
STACKABLE CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Sep. 29, 1982, Ser. No. 426,993
Term of patent 14 years
U.S. Cl. D34—43

277,799
HOLDER FOR UTENSILS
Frank DiSesa, 74 Goodrich St., Lunenburg, Mass. 01462
Filed Sep. 29, 1982, Ser. No. 426,994
Term of patent 14 years
U.S. Cl. D34—43

277,800
STACKABLE CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Sep. 29, 1982, Ser. No. 426,995
Term of patent 14 years
U.S. Cl. D34—43



277,801
TOOL TRAY
Edward D. Levy, Franklin Lakes, and Michael P. Ballone, New Providence, both of N.J., assignors to Gee Associates, Fort Lee, N.J.
Filed Sep. 29, 1982, Ser. No. 426,793
Term of patent 14 years
U.S. Cl. D34—44

277,802
ROSARY

Lucas R. Luchetti, 133 Half Mile Rd., North Haven, Conn. 06473

Continuation-in-part of Ser. No. 174,911, Aug. 11, 1980, which is a continuation-in-part of Ser. No. 125,943, Feb. 29, 1980. This application Sep. 16, 1980, Ser. No. 184,701

Term of patent 14 years

U.S. Cl. D99—26

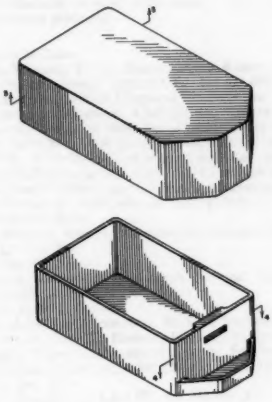
277,803
LOCK BOX

Lloyd Franko, 9580 Crackel Rd., Aurora, Ohio 44202, and Lenard Lapchynski, 8219 S. Bedford Rd., Macedonia, Ohio 44056

Filed Sep. 29, 1982, Ser. No. 427,898

Term of patent 14 years

U.S. Cl. D99—28



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TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abe, Naoto; Akimoto, Hidetoshi; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Method for removing a selenium layer from a substrate. 4,501,621, Cl. 134-17.000.

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Adams, L. Jane, to Eastman Kodak Company. Process for the preparation of high molecular weight polyesters. 4,501,878, Cl. 528-286.000.

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Albert, Frank, Jr., to Preformed Marine, Inc. Ball type universal joint and method of manufacture. 4,501,511, Cl. 403-24.000.

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Funk, James E., 4,501,205, Cl. 110-347.000.

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Allen, Richard S.: *See—*
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Kawauchi, Masahiko, 4,501,938, Cl. 200-5.00A.

Althoff, Heinz J., to Vereinigte Deutsche Metallwerke AG. Alloy and process for manufacturing rolled strip from an aluminum alloy especially for use in the manufacture of two-piece cans. 4,501,627, Cl. 148-437.000.

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Amano, Matsuo; Sakamoto, Shinichi; Hirayama, Takeshi; and Sasayama, Takao, to Hitachi, Ltd. Fuel injection control apparatus for internal combustion engine. 4,501,249, Cl. 123-478.000.

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Bauer, Carl F.; Hussey, James H.; Langston, Benny; and Parikh, Niranjan M., 4,501,614, Cl. 75-257.000.
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Super, Scott S.; Hsu, Joseph C.; Haffner, William B.; and Jesse, Jerry F., 4,501,797, Cl. 428-349.000.

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Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., to Allegheny Ludlum Steel Corporation. Method of casting amorphous metals. 4,501,316, Cl. 164-463.000.
Ametc Development Company: *See*—
Maloblocki, Richard, 4,501,292, Cl. 137-533.110.
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Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., 4,501,072, Cl. 34-1.000.
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Kusaka, Iwao, 4,501,233, Cl. 122-406.00S.
Bagby, George W., to Washington State University Research Foundation, Inc. Process for fusing bone joints. 4,501,269, Cl. 128-92.00G.

Bajka, Imre; and Furrer, Robert, to Siemens Aktiengesellschaft Berlin & Munchen. Method for removing solder from the drill holes of empty printed circuit boards coated with solder. 4,501,770, Cl. 427-97.000.

Baker, Christopher J.: *See*—
Fenemore, Keith E.; Foden, George P.; and Baker, Christopher J., 4,501,973, Cl. 290-1.00A.

Baker, Joseph, to Automatic Switch Company. Rotary valve. 4,501,297, Cl. 137-625.460.

Baker Oil Tools, Inc.: *See*—
Anderson, David M.; and Kim, Yung J., 4,501,440, Cl. 285-47.000.

Baker, Pamela K.; and Kiernan, Jane A., to American Cyanamid Company. Phenylethanolamine derivatives and acid addition salts thereof for enhancing the growth rate of meat-producing animals and improving the efficiency of feed utilization thereby. 4,501,751, Cl. 514-374.000.

Balaban, Alvin R.: *See*—
Steckler, Steven A.; and Balaban, Alvin R., 4,502,078, Cl. 358-188.000.

Baldwin, John J.; Jones, James H.; and Lundell, George F., to Merck & Co., Inc. Amino substituted tetrahydrobenzindoles. 4,501,900, Cl. 548-436.000.

Ballard, Lowell D.: *See*—
Edelman, Seymour; and Ballard, Lowell D., 4,501,319, Cl. 165-84.000.

Bannink, Engbert T., Jr.; and Olson, Glenn O., to Boeing Company, The. Integral lightning protection system for composite aircraft skins. 4,502,092, Cl. 361-218.000.

Bannochie, John G., to Eltech Systems Corporation. Porous gas diffusion-electrode. 4,501,803, Cl. 429-101.000.

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Barfield, Gilbert; and Hagopian, Gary J. Mold and method for forming golf balls. 4,501,715, Cl. 264-248.000.

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Krenzer, Eberhard, 4,501,046, Cl. 19-0.350.

Barnes, Lant I. Casting rod. 4,501,085, Cl. 43-19.000.

Bartl, Herbert; Alberts, Heinrich; and Schuster, Klaus, to Bayer Aktiengesellschaft. Process for the production of anhydride-group- or carboxyl-group-containing graft copolymers of polysaccharide esters. 4,501,871, Cl. 527-313.000.

Barton, Derek H. R.; Motherwell, William B.; and Zard, Sammir Z., to Roussel Uclaf. 20-Isocyano-$\Delta^{17(20)}$-steroids. 4,501,701, Cl. 260-397.400.

Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., to Eli Lilly and Company. Process for preparing 2-acetylthiomethyl-5-guanidinopentanoic acid. 4,501,703, Cl. 260-455.00R.

Bass, Roy K.: *See*—
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Bates, Howard J., Jr., to NL Industries, Inc. Tensioner apparatus with emergency limit means. 4,501,219, Cl. 114-264.000.

Battelle Memorial Institute: *See*—
Boegli, Jean-Charles; and Trouilhet, Yves, 4,501,145, Cl. 73-204.000.

Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., to Iomega Corporation. Magnetic disk drive having a movable drive motor. 4,502,083, Cl. 360-99.000.

Bauer, Carl F.; Hussey, James H.; Langston, Benny; and Parikh, Niranjan M., to American Can Company. Flux in recovery of aluminum in reverberatory furnace and method of making. 4,501,614, Cl. 75-257.000.

Bauer, Friedrich; and Leonhard, Kurt, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Air-compressing, direct-injection internal combustion engine. 4,501,239, Cl. 123-261.000.

Baumbach, Bertram W., to Reliance Electric Company. Line protector for a communications circuit. 4,502,088, Cl. 361-124.000.

Baumgartner Papier S.A.: *See*—
Boegli, Serge; and Lebet, Jean-Pierre, 4,501,579, Cl. 493-45.000.

Baur, Roland: *See*—
Biondetti, Mario; and Baur, Roland, 4,501,040, Cl. 8-156.000.

Baus, Richard E.; and Swift, Graham, to Rohm and Haas Company. Emulsion polymer of heterogeneous molecular weight and preparation thereof. 4,501,845, Cl. 524-460.000.

Baxter, Kenneth F.: *See*—
Reeder, Frank; Nunn, Michael J.; Mitchell, Michael J.; and Baxter, Kenneth F., 4,501,615, Cl. 106-14.390.

Baxter Travenol Laboratories, Inc.: *See*—
Bilstad, Arnold C.; and Foley, John T., 4,501,531, Cl. 417-63.000.

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Elbe, Hans-Ludwig; and Hammann, Ingeborg, 4,501,753, Cl. 514-447.000.
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Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,501,516, Cl. 405-260.000.
Krimm, Heinrich; and Buysch, Hans-Josef, 4,501,905, Cl. 549-228.000.
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Bayerische Motoren Werke AG: *See*—
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Bazell, Graydon C., to Alfa-Laval, Inc. Method and apparatus for treatment of oily waste. 4,501,671, Cl. 210-781.000.

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Crane, Joseph J.; and Beasley, Daniel T., 4,501,467, Cl. 350-6.100.

Beatty, Michael C.: *See*—
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Bechtel National Corp.: *See*—
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Beck, Jeffrey D.: *See*—
Tregilgas, John H.; Beck, Jeffrey D.; Kinch, Michael A.; and Schaake, Herbert F., 4,501,625, Cl. 148-20.300.

Becke, Gerhart: *See*—
Stebegg, Josef; and Becke, Gerhart, 4,501,463, Cl. 339-99.00R.

Becker, David A., to Dorso Trailer Sales, Inc. Load transfer axle assembly. 4,501,437, Cl. 280-704.000.

Beckman Instruments, Inc.: *See*—
Piramoon, Alireza, 4,501,565, Cl. 494-85.000.

Beecham Group p.l.c.: *See*—
Dales, John R. M.; and Vallance, Marguerita A., 4,501,696, Cl. 260-245.20R.

Begg, Alan R., to British Petroleum Company. Powder forging of aluminum and its alloys. 4,501,611, Cl. 75-0.50R.

Beiermann, Norbert: *See*—
Kretschmer, Horst; Tietze, Gunter; Beiermann, Norbert; Schingnitz, Manfred; and Goehler, Peter, 4,501,156, Cl. 73-861.040.

Beitinger, Eberhard: *See*—
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Bell, Robert L.; and Lathlaen, Richard A., to Combustion Engineering, Inc. High accuracy differential pressure capacitive transducer and methods for making same. 4,501,051, Cl. 29-25.410.

Beloit Corporation: *See*—
Karr, Gerald W.; and Muller, Gernot, 4,501,197, Cl. 100-35.000.

Benin, Joshua; and Luoma, Robert P., II, to Du Pont de Nemours, E. I., and Company. Electric heating element for sterilely cutting and welding together thermoplastic tubes. 4,501,951, Cl. 219-243.000.

Benson, Jon M.: *See*—
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Bercovici, Serge, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Method of controlling and regulating operational parameters of a machine for continuously casting bands between cylinders, allowing adhesion to be avoided. 4,501,315, Cl. 164-454.000.

Berfield, Robert C., to Shop-Vac Corporation. Resilient detented lid latch. 4,501,378, Cl. 220-324.000.

Berg, Howard M.: *See*—
Mitchell, Curtis W.; and Berg, Howard M., 4,501,637, Cl. 156-630.000.

Berg, Lloyd; and Yeh, An-I. Separation of methanol from acetone by extractive distillation. 4,501,645, Cl. 203-51.000.

Bergersen, Hans A.; and Risberg, Eilif, to International Standard Electric Corporation. Electrical resistance heating element. 4,501,956, Cl. 219-553.000.

Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,501,520, Cl. 411-21.000.

Berke, Carl M., to Polaroid Corporation. Polyacrylic acid/chitosan polyelectrolyte complex. 4,501,835, Cl. 524-32.000.

Berley, Jerry W.: *See*—
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Berner, Victor G.: *See*—
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Bertrand, Andre : *See*—
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Bethell, George L.; Burch, Donald F.; and Hinkhouse, Lysle R., to Sears Manufacturing Co. Mold assembly for molding cushion articles. 4,501,541, Cl. 425-117.000.

Betts, Max W.: *See*—
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Biasini, Lino; Biasini, Americole R.; and Clausen, Eivind, 4,501,220, Cl. 118-73.000.

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Bick, Hal W. Rotatable heating apparatus. 4,501,955, Cl. 219-469.000.

Bickford, Harold J.: *See*—
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Bienvenu, E. Gayle: *See*—
Bienvenu, Gerald A.; and Bienvenu, E. Gayle, 4,501,226, Cl. 119-1.000.

Bienvenu, Gerald A.; and Bienvenu, E. Gayle. Disposable pet litter container. 4,501,226, Cl. 119-1.000.

Bilberry, Johnny B. Neck support. 4,501,023, Cl. 2-2.000.

Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Control circuit for a blood fractionation apparatus. 4,501,531, Cl. 417-63.000.

Biomet, Inc.: *See*—
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Biondetti, Mario; and Baur, Roland, to Escher Wyss GmbH. Method and apparatus for washing stock suspensions by removing undesirable material through an endless wire. 4,501,040, Cl. 8-156.000.

Biondetti, Mario, to Escher Wyss GmbH. Wire machine, for dewatering stock suspensions. 4,501,662, Cl. 210-391.000.

BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,501,581, Cl. 604-52.000.

Bires, Robert J.: *See*—
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Bismarck, Otto H., to RCA Corporation. Coincident pulse cancelling circuit. 4,502,014, Cl. 328-110.000.

Blackstone Corporation: *See*—
Real, John D.; Twichell, David J.; and Weed, Lauren R., 4,501,321, Cl. 165-153.000.

Blackwell, James B.; Marks, Gerald C.; and Vereecke, Paul, to BP Chemicals Limited. Phenolic foam composites and process for making them. 4,501,794, Cl. 428-316.600.

Blair, Howard D.: *See*—
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Blais, Marcel H.: *See*—
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Blake, William: *See*—
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Blanchard, Clarence E., to Outboard Marine Corporation. Marine propulsion device for sailboats. 4,501,562, Cl. 440-61.000.

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Blaugrund, Robert: *See*—
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Blessington, Daniel R., to Xerox Corporation. Electrical interconnection system. 4,502,059, Cl. 346-140.00R.

Blessum, Norman S.: *See*—
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Bloch, Peter: *See*—
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Blomley, Peter F., to International Standard Electric Corporation. Gain regulation circuit for an amplifier circuit. 4,502,018, Cl. 330-254.000.

Blomquist, Bradley E. Fishing equipment. 4,501,087, Cl. 43-42.060.

Blucher, Steven L., to Dimarzio Musical Instrument Pickups. Transducer for stringer musical instrument. 4,501,185, Cl. 84-1.150.

Blum, Michael R.: *See*—
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Blyth, Randolph C.: *See*—
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Boan, William J.; and Coomes, Robert D., to Purex Corporation. Agglomerator. 4,501,499, Cl. 366-156.000.

Boaz, Premakaran T. Structure for a modular greenhouse and the like. 4,501,099, Cl. 52-82.000.

Bock, Erich: *See*—
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Bockris, John O.; Szklarczyk, Marek; and Contractor, Aliasgar Q., to Texas A&M University. Photo-assisted electrolysis cell with p-silicon and n-silicon electrodes. 4,501,804, Cl. 429-111.000.

Boegli, Jean-Charles; and Trouilhet, Yves, to Battelle Memorial Institute. Immersion thermal exchange parameter determination. 4,501,145, Cl. 73-204.000.

Boegli, Serge; and Lebet, Jean-Pierre, to F. J. Burrus & Cie.; and Baumgartner Papier S.A. Cigarette filter units. 4,501,579, Cl. 493-45.000.

Boeing Company, The: *See*—
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Bogenschutz, Thomas M., to General Signal Corporation. Disc brake assembly. 4,501,346, Cl. 188-218.0XL.

Bogese, Stephen B., II, to Virginia Patent Development Corporation. Modular connector with improved housing and contact structure. 4,501,464, Cl. 339-176.00M.

Bohrer, Philip J.: *See*—
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Boisvert, J. Roger; Schultz, Samuel; and Blaugrund, Robert. Fly trap with disposable collector. 4,501,088, Cl. 43-118.000.

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Boots Company PLC, The: *See*—
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Borrelli, Nicholas F.; Keck, Donald B.; Morse, David L.; and Sachenik, Paul A., to Corning Glass Works. Integral optical imaging devices using grin lens systems. 4,501,468, Cl. 350-96.250.

Boschi, Pier M.: *See*—
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Bosso, Joseph F.; and Geiger, William J., to PPG Industries, Inc. Low temperature aminoplast curable cationic electrodepositable coating compositions. 4,501,833, Cl. 523-416.000.

Bostian, Clarence L., Jr.; and Gelula, Jerome D., to Gelula, Jerome D. Method for producing unwoven novel oriented pre-stressed web. 4,501,631, Cl. 156-161.000.

Bott, John A. Cross rail for vehicle luggage carrier. 4,501,385, Cl. 224-319.000.

Bouboulis, Constantine J.; and Kuntz, Irving, to Exxon Research & Engineering Co. Superior solvent blends for synthesis of acrylic resins for high solids coatings. 4,501,868, Cl. 526-208.000.

Boucher, Richard C.; Gatzy, John T.; and Knowles, Michael R., to Research Corporation. Aerosolized amiloride treatment of retained pulmonary secretions. 4,501,729, Cl. 424-45.000.

Bourland, Larry G., to Atlantic Richfield Company. Vinylidene chloride copolymer-based molding compound. 4,501,848, Cl. 524-527.000.

Bourland, Larry G., to Atlantic Richfield Company. Chlorinated polyvinyl chloride molding compound. 4,501,849, Cl. 524-527.000.

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Bower, Frank A., Jr. Apparatus for delivering liquid under pressure. 4,501,533, Cl. 417-388.000.

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Boyer, Jack C., to Deere & Company. Self-locking hinge. 4,501,045, Cl. 16-331.000.

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Bradt, Richard C., to Metal Alloys, Inc. Method of consolidating a metallic or ceramic body. 4,501,718, Cl. 419-49.000.

Bramlett, Kenneth W.: *See*—
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Brandi, Adolph J., Sr.: *See*—
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Brandl, Rudolf; and Doll, Herbert, to Heckler & Koch GmbH. Silenced hand-held firearm with rotating tube and sleeve. 4,501,189, Cl. 89-14.400.

Brandt, Lennart; and Pichl, Heinz, to AB Volvo Penta. Inboard outboard drive. 4,501,560, Cl. 440-53.000.

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Braus, Harry, to National Distillers and Chemical Corporation. Silane oligomers useful as anti-treeing additives. 4,501,688, Cl. 252-573.000.

Bray, Carl R.; and Cueni, Lee. Cotton candy accessory for blender. 4,501,538, Cl. 425-9.000.
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Breda, Enzo; and Ciotti, Alfredo, to SALUS Ricerca e Sviluppo di CROCE' Dr. Francesco & C. Snc. Device for optical indication of the phenomena of coagulation of blood, concentration and aggregation of blood platelets, or the like. 4,501,491, Cl. 356-39.000.
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Bukhteev, Pavel I.; Posleider, Grigory Y.; Kartavtsev, Viktor M.; and Bytsak, Vladimir S., to Nauchno-Issledovatelsky I Experimentalny Institut Avtomovilnogo Elektrooborudovania I Avtopriborov. Machine for laying conductors into slots. 4,501,059, Cl. 29-564.500.
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Usry, Joe D., 4,501,405, Cl. 251-7.000.
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Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,501,596, Cl. 44-63.000.
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Cairone, David C., Sr. Luminescent foam floats and method. 4,501,564, Cl. 441-20.000.
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Divoky, Ralph A., 4,501,545, Cl. 425-275.000.
Cam Gears Limited: *See*—
Webber, Gordon E. G.; and Wilson, Alan G., 4,501,191, Cl. 91-375.00A.
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Charles, Herbert N., 4,501,129, Cl. 62-239.000.
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Cannon, William N., to Eli Lilly and Company. Nitrosamine inhibition. 4,501,608, Cl. 71-121.000.
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Ando, Yujiro; and Fujii, Haruo, 4,502,061, Cl. 346-153.100.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,501,481, Cl. 354-413.000.
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Miyamoto, Koichi; and Tonomura, Yoshinobu, 4,501,490, Cl. 355-55.000.
Sakai, Kiyoshi; Ishikawa, Shozo; Arita, Tetsuo; Mabuchi, Minoru; and Umehara, Shoji, 4,501,808, Cl. 430-59.000.
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,501,807, Cl. 430-57.000.
Takahashi, Yuji; Masaki, Hisaji; Adachi, Muneo; and Igarashi, Masaru, 4,501,419, Cl. 271-288.000.
Tsuda, Shin, 4,502,080, Cl. 358-256.000.
Canron Corp.: *See*—
Delucia, Anthony, 4,501,200, Cl. 104-10.000.
Cantatore, Giuseppe, to Ciba-Geigy S.p.A. Piperidine derivatives which are stabilisers for synthetic polymers. 4,501,837, Cl. 524-100.000.
Carding Specialists (Canada) Ltd.: *See*—
Varga, John M., 4,501,048, Cl. 19-106.00R.
Carl, Robert H., Jr.; Koontz, Floyd; and Pedtke, Daniel F., to Harris Corporation. High speed PIN diode switched antenna coupler and method. 4,502,025, Cl. 333-24.00R.
Carlsen, Arthur T.: *See*—
Zemek, Albert W.; and Carlsen, Arthur T., 4,501,065, Cl. 29-845.000.
Carlson, Roland W.; and Blaskis, Edward A., to Technicare Corporation. Method for assembling a high vacuum rotating anode X-ray tube. 4,501,566, Cl. 445-28.000.
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Carrier Corporation: *See*—
Hannett, William J., 4,502,084, Cl. 361-23.000.
Hargis, Larry N., 4,501,534, Cl. 417-572.000.
Caruso, Peter J., to Allied Corporation. High reliability solenoid switch. 4,502,030, Cl. 335-164.000.
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Tsuzuki, Hanzo, 4,502,119, Cl. 364-405.000.
Cassidy, Benjamin J., to International Paper Company. Anti-sift carton. 4,501,388, Cl. 229-37.00R.
Castaldi, Graziano: *See*—
Giordano, Claudio; and Castaldi, Graziano, 4,501,913, Cl. 560-100.000.

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Castel, Yvon; and Iato, Michel, to Societe Nationale Elf Aquitaine (Production). Tool for disconnecting a guideline connector and a process for using same. 4,501,056, Cl. 29-252.000.
Castle, Craig A.; Benson, Jon M.; and Toch, Theodore H., to Xomed, Inc. Replaceable saliva barrier for intra-oral larynx. 4,502,151, Cl. 381-70.000.
Caterpillar Tractor Co.: *See—*
Richardson, Richard W., 4,501,950, Cl. 219-124.340.
Satzler, Ronald L., 4,501,629, Cl. 156-149.000.
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Cathell, Philip W. Elongated wand-type wind-up and trigger-released separable actuator for motorized toy. 4,501,567, Cl. 446-430.000.
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Forman, Steven E.; and Caunt, James W., 4,501,966, Cl. 250-332.000.
Causer, Roy; and Orr, Donald, to United Kingdom Atomic Energy Authority. Manipulator. 4,501,522, Cl. 414-4.000.
CBM Display Group Limited: *See—*
Fox, Clifford R., 4,501,369, Cl. 211-133.000.
CBS Inc.: *See—*
Stone, George C.; and Ross, Stuart E., 4,501,424, Cl. 273-148.00B.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Bercovici, Serge, 4,501,315, Cl. 164-454.000.
Celanese Corporation: *See—*
Foley, Paul, 4,501,822, Cl. 502-162.000.
Sarada, Thyagaraja, 4,501,793, Cl. 428-315.500.
Celette, Germain, to Celette S.A. Device for straightening automobile bodies or the like. 4,501,136, Cl. 72-447.000.
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Cerny, Frank T.; and Lapsker, Irving, to Abex Corporation. Segmented disc brake pad. 4,501,347, Cl. 188-250.00G.
CertainTeed Corporation: *See—*
Piotrowski, Tony S., 4,501,107, Cl. 53-438.000.
Chaki, Takao, to Clarion Co., Ltd. Cross arm mechanism in a pushbutton tuner. 4,501,165, Cl. 74-10.330.
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Chambers, William S. Thrust bearing. 4,501,505, Cl. 384-152.000.
Champion International Corporation: *See—*
Wells, Henry A., 4,501,642, Cl. 162-198.000.
Chandler, Curtis S.; Novotny, Larry G.; and Watts, Elvert S., to AMP Incorporated. Electrical connector. 4,501,459, Cl. 339-48.000.
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., to PPG Industries, Inc. Moisture curable compositions containing reaction products of hydrophobic polyols and organosilicon-containing materials. 4,501,872, Cl. 528-18.000.
Charles, Herbert N., to Canadian Fram Limited. Integral engine air conditioning system. 4,501,129, Cl. 62-239.000.
Chasar, Dwight W., to B. F. Goodrich Company, The. 2-Naphthyl phosphoramidites and compositions thereof. 4,501,684, Cl. 252-400.00A.
Chaulk, Donald E., to Allis-Chalmers Corp. Adjustable stop for position control lever for draft load sensing system. 4,501,168, Cl. 74-526.000.
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, to Upjohn Company, The. Polyamides with talc as crystallization promoter. 4,501,844, Cl. 524-451.000.
Chen, Nai Y.: *See—*
LaPierre, Rene B.; Partridge, Randell D.; Chen, Nai Y.; and Wong, Steven S., 4,501,926, Cl. 585-739.000.
Cheng, Paul J., to Phillips Petroleum Company. Counter-rotational flow in a carbon black reactor. 4,501,720, Cl. 422-156.000.
Cherry, Sidney J., to Westinghouse Electric Corp. Vacuum interrupter contact material. 4,501,941, Cl. 200-144.00B.
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Dodds, Stephen G., 4,501,076, Cl. 36-11.000.
Chevron Research Company: *See—*
DePriester, Coral L., 4,501,329, Cl. 166-292.000.
Chicago Bridge & Iron Company: *See—*
Cutler, Donald R., 4,501,122, Cl. 62-116.000.
Chicago Rawhide Manufacturing Company: *See—*
Peisker, Glenn; Christiansen, Keith; and Jaime, Gil, 4,501,431, Cl. 277-134.000.
Chicopee: *See—*
Holmes, Rory A.; and Sun, Eleanor, 4,501,792, Cl. 428-299.000.
Chikura Kogyo Kabushiki Kaisha: *See—*
Yoshida, Kei; Murokawa, Masayuki; and Nomura, Toshiaki, 4,501,090, Cl. 49-264.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,501,732, Cl. 424-114.000.
Chisso Corporation: *See—*
Yazu, Kazumasa; Adachi, Yasuto; and Yoshizaki, Takayoshi, 4,501,610, Cl. 75-0.5AA.
Chivens, David E.; and Cloward, Laramie J., to L & F Industries. Stress sensor for yield-point detection in a stretch press. 4,501,135, Cl. 72-302.000.
Chmiel, Chester T.; and Cotsakis, Daniel J., to Uniroyal, Inc. Adhesive for bonding cured EPDM rubber. 4,501,842, Cl. 524-432.000.
Christiansen, Keith: *See—*
Peisker, Glenn; Christiansen, Keith; and Jaime, Gil, 4,501,431, Cl. 277-134.000.
Christman, Chris L., to United States of America, Health and Human Services. Ultrasonic therapy applicator that measures dosage. 4,501,151, Cl. 73-646.000.
Chu, George; and Casella, Sharon, to Collagen Corporation. Automatic syringe filling system. 4,501,306, Cl. 141-94.000.
Chu, Shaw C.; and Spencer, Arthur T. Aqueous coating compositions and process for their preparation from epoxy acidic acrylic polymer and polyfunctional amine. 4,501,831, Cl. 523-412.000.
Chubachi, Noriyoshi: *See—*
Konno, Junichi; Ueda, Yukihiro; Niitsuma, Hiroaki; and Chubachi, Noriyoshi, 4,501,149, Cl. 73-587.000.
Chugai Ro Co., Ltd.: *See—*
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Cianci, James P.; and Dunn, William J., to Kendall Company, The. Liquid drainage system with formed hinged support sheet. 4,501,584, Cl. 604-322.000.
Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie; and Bloch, Peter, 4,501,592, Cl. 8-676.000.
Cook, Barry, 4,501,667, Cl. 210-700.000.
Ciba-Geigy S.p.A.: *See—*
Cantatore, Giuseppe, 4,501,837, Cl. 524-100.000.
Ciotti, Alfredo: *See—*
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Cities Service Company: *See—*
Gregoli, Armand A., 4,501,445, Cl. 299-2.000.
Clarion Co., Ltd.: *See—*
Chaki, Takao, 4,501,165, Cl. 74-10.330.
Chaki, Takao, 4,501,166, Cl. 74-10.330.
Clark, Leonard R., Jr.; and Greene, Howard P., Jr. Spherical vehicle control system. 4,501,569, Cl. 446-458.000.
Clausen, Eivind: *See—*
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Clavier, Christian M.; Dumanoir, Jean L.; and Dumestre, Alexis C., to Schlumberger Technology Corporation. Machine method for determining the presence and location of hydrocarbon deposits within a subsurface earth formation. 4,502,121, Cl. 364-422.000.
Cleary, James W., to Phillips Petroleum Company. N-Methyl pyrrolidone-2 purification. 4,501,902, Cl. 548-555.000.
Clem, Arthur J., to Clem Environmental Corp. Waterproofing soil. 4,501,788, Cl. 428-240.000.
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Clem, Arthur J., 4,501,788, Cl. 428-240.000.
Clemence, Francois; Medici, Italo; Fournex, Robert; and Tournemine, Colette, to Roussel Uclaf. Blood oxygenating and cerebral vasoregulating 20,21-dinoreburnamenines. 4,501,740, Cl. 514-283.000.
Clifton, John T.; and Spear, John W., to Spear, John William. Resuscitator. 4,501,271, Cl. 128-205.130.
Clineschmidt, Bradley V., to Merck & Co., Inc. Peripherally selective dopamine antagonists in the treatment of ocular hypertension. 4,501,749, Cl. 514-326.000.
Cloward, Laramie J.: *See—*
Chivens, David E.; and Cloward, Laramie J., 4,501,135, Cl. 72-302.000.
Cluniat, Claude; and Delattre, Joseph, to LGT Laboratoire General des Telecommunications. Selective efficiency videofrequency nonlinearity correction device. 4,502,076, Cl. 358-160.000.
Coal Industry (Patents) Limited: *See—*
Eagles, Brian A., 4,501,449, Cl. 299-81.000.
Coates, Jacqueline A.: *See—*
Connell, David L.; and Coates, Jacqueline A., 4,501,672, Cl. 252-8.50M.
Cobden, Kenneth J., to Cobden Turbines Pty. Ltd. Frost control. 4,501,089, Cl. 47-2.000.
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Cobden, Kenneth J., 4,501,089, Cl. 47-2.000.
Cockram, Geoffrey N.: *See—*
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Coherent, Inc.: *See—*
Allen, Peter N.; and Blake, William, 4,502,145, Cl. 372-38.000.
Coker, Geoffrey G.: *See—*
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Colby, George V., Jr., to Avco Corporation. Passive data acquisition and analysis system for microwave. 4,502,052, Cl. 343-458.000.
Colgate-Palmolive Company: *See—*
Aszman, Harry W.; Buck, Charles E.; and Everhart, Cherie H., 4,501,680, Cl. 252-142.000.
Groult, Alain; and Samec, Jean, 4,501,681, Cl. 252-174.120.
Su, Dean T., 4,501,834, Cl. 524-28.000.

Collagen Corporation: *See*—
Chu, George; and Casella, Sharon, 4,501,306, Cl. 141-94.000.
Collins Dynamics: *See*—
Collins, William J., 4,502,103, Cl. 362-249.000.
Collins, William J., to Collins Dynamics. Light with mount for plural lamp bulbs. 4,502,103, Cl. 362-249.000.
Combined America Industries, Inc.: *See*—
Davis, Alan H., 4,501,101, Cl. 52-404.000.
Combustion Engineering, Inc.: *See*—
Bell, Robert L.; and Lathlaen, Richard A., 4,501,051, Cl. 29-25.410.
McCartney, Michael S.; and Pollock, William H., 4,501,204, Cl. 110-264.000.
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Commonwealth Moulding Pty. Limited: *See*—
Bushby, Maxwell J., 4,501,376, Cl. 220-298.000.
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Schneider, Andre, 4,501,578, Cl. 474-201.000.
Comparetto, John E. Bone wedge guidance system. 4,501,268, Cl. 128-92.00E.
Conee, Paul T. Camera support cushion. 4,501,401, Cl. 248-346.000.
Connell, David L.; and Coates, Jacqueline A., to Sandoz Ltd. Organic compounds. 4,501,672, Cl. 252-8.50M.
Consan Pacific Incorporated: *See*—
Saurenman, Donald G., 4,502,093, Cl. 361-231.000.
Consiglio, Pietro: *See*—
Siligoni, Marco; and Consiglio, Pietro, 4,502,016, Cl. 330-146.000.
Consolidated Natural Gas Service Company, Inc.: *See*—
Gerstmann, Joseph; Hauck, William M.; Raymond, Robert; and Swenson, Paul F., Jr., 4,501,253, Cl. 123-527.000.
Contractor, Aliasgar Q.: *See*—
Bockris, John O.; Szklarczyk, Marek; and Contractor, Aliasgar Q., 4,501,804, Cl. 429-111.000.
Convergent Technologies, Inc.: *See*—
Lowenthal, Richard W.; Seike, Stephen C.; and Walsh, Gregory V., 4,502,038, Cl. 340-365.00S.
Sisler, John R., 4,501,460, Cl. 339-49.00R.
Cook, Barry, to Ciba-Geigy Corporation. Process of inhibiting corrosion of metal surfaces and/or deposition of scale thereon. 4,501,667, Cl. 210-700.000.
Cook International, Inc.: *See*—
Hill, James J.; and Marven, Al, 4,501,409, Cl. 251-354.000.
Coomes, Robert D.: *See*—
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Cooper Industries, Inc.: *See*—
Spreadbury, Robert J., 4,501,994, Cl. 315-307.000.
Corazza, Herman. Body shop worktable. 4,501,202, Cl. 108-50.000.
Corna, John F.; and Blais, Marcel H., to Statewide Pools, Inc. Method and apparatus for making swimming pools. 4,501,100, Cl. 52-169.700.
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Borrelli, Nicholas F.; Keck, Donald B.; Morse, David L.; and Sachenik, Paul A., 4,501,468, Cl. 350-96.250.
Miller, Stephen B.; Stewart, Ronald L.; and Thompson, David A., 4,501,602, Cl. 65-18.200.
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Courtney, Thomas F., Jr.: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,501,904, Cl. 549-35.000.
Craig, Harold M.; and Feder, Ernest, to United Technologies Corporation. Method of making rotor blade for a rotary machine. 4,501,053, Cl. 29-156.80R.
Crane, Joseph J.; and Beasley, Daniel T., to Crosfield Data Systems, Inc. Scanning system employing a laser beam. 4,501,467, Cl. 350-6.100.
Crews, Mark E., to Cameron Iron Works, Inc. Tension hanger landing bowl. 4,501,441, Cl. 285-143.000.
Critikon, Inc.: *See*—
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Crochet, Michel: *See*—
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Croes, Robert C.: *See*—
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Crosfield Data Systems, Inc.: *See*—
Crane, Joseph J.; and Beasley, Daniel T., 4,501,467, Cl. 350-6.100.
Csengery, Ladislao C., to Lockheed Electronics Company, Inc. Apparatus for detecting errors in a digital data stream encoded in a double density code. 4,502,142, Cl. 371-55.000.
Cubbage, William R., to Heath Company. Locking hinge for a printed circuit board. 4,501,458, Cl. 339-17.00L.
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Bray, Carl R.; and Cueni, Lee, 4,501,538, Cl. 425-9.000.
Culley, Bobby G.; and Surtani, Kishin, to Texas Instruments Incorporated. Automated liquid crystal display and process. 4,501,471, Cl. 350-334.000.
Cunningham, Gordon L.: *See*—
Shone, Edward B.; Wilson, Robert W.; and Cunningham, Gordon L., 4,501,124, Cl. 62-129.000.
Cunningham, Robert J.: *See*—
Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., 4,501,072, Cl. 34-1.000.
Cutler, Donald R., to Chicago Bridge & Iron Company. Liquid piston heat pump. 4,501,122, Cl. 62-116.000.
D. M. International Ltd.: *See*—
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Brescia, Riccardo; Buat, Mario; Dagna, Giandomenico; and Scardovi, Alessandro, 4,502,054, Cl. 346-75.000.
Daido Metal Company Ltd.: *See*—
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Tatemoto, Masayoshi; Oka, Masahiko; Kano, Hideo; Tomoda, Masayasu; and Ueta, Yutaka, 4,501,869, Cl. 526-249.000.
Dainichi-Nippon Cables, Ltd.: *See*—
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Dales, John R. M.; and Vallance, Marguerita A., to Beecham Group p.l.c. Process for the preparation of penam derivatives. 4,501,696, Cl. 260-245.20R.
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, to Hoechst Aktiengesellschaft. Process and device for making alkali metal phosphates by spraying alkali metal phosphate solutions or suspensions. 4,501,639, Cl. 159-48.100.
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David, Agoston: *See*—
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,501,732, Cl. 424-114.000.
Davis, Alan H., to Combined America Industries, Inc. Fire rated component wall system. 4,501,101, Cl. 52-404.000.
Davis, Burns: *See*—
Barbee, Robert B.; Bass, Roy K.; Davis, Burns; and Minnick, Larry A., 4,501,879, Cl. 528-288.000.
Davis, Delbert A., to Burlington Industries, Inc. Non-woven fabric for V-belt bead wrap and chafer. 4,501,791, Cl. 428-286.000.
Davis, James R.: *See*—
Halone, William; and Davis, James R., 4,501,379, Cl. 221-221.000.
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Null, Michael W.; Dotson, Robert N.; and Davis, Robert B., 4,501,979, Cl. 307-494.000.
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Lell, Rainer, 4,501,725, Cl. 423-573.00R.
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Long, Delmar D., 4,501,771, Cl. 427-176.000.
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Boyer, Jack C., 4,501,045, Cl. 16-331.000.
Hook, Wolfgang, 4,501,572, Cl. 464-170.000.
Huang, Ray C., 4,501,452, Cl. 305-27.000.
Ptacek, Michael V., 4,501,334, Cl. 172-832.000.
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Deft Chemical Coatings, Inc.: *See*—
Albers, Richard A., 4,501,832, Cl. 523-414.000.
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Menschner, Rolf; and Fischer, Robert, 4,501,778, Cl. 427-376.200.
Merk, Wolfgang; and Rink, Karl-Heinz, 4,501,668, Cl. 210-749.000.
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Delmas, Michel; Gaset, Antoine; and le Bigot, Yves, to Agrifurane, S.A. Process for transforming an aldehyde into an alkene. 4,501,910, Cl. 549-506.000.
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Delucia, Anthony, to Canron Corp. Tamping tool retainer. 4,501,200, Cl. 104-10.000.
Demerson, Christopher A.: *See*—
Abraham, Nedumparambil A.; and Demerson, Christopher A., 4,501,899, Cl. 548-432.000.
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Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., to Dresser Industries, Inc. Method of distributing load among stacked bearings. 4,501,454, Cl. 384-619.000.
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Breuer, Hermann; Treuner, Uwe D.; and Denzel, Theodor, 4,501,743, Cl. 514-201.000.
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De Vincentiis, Leonardo, to Ausonia Farmaceutici S.r.l. 2-Hydroxy-3-(o-methoxy-phenoxy)propyl 2-(p-isobutyl-phenyl)-propionate and pharmaceutical compositions containing the same. 4,501,914, Cl. 560-105.000.
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Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,501,639, Cl. 159-48.100.
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Diamond Shamrock Chemicals Company: *See*—
Marcellis, Alphonso W.; Johnson, Grannis S.; and Grinstein, Reuben H., 4,501,594, Cl. 44-51.000.
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Ishizuka, Yutaka, 4,501,537, Cl. 418-150.000.
Taira, Shigeo, 4,501,245, Cl. 123-446.000.
DiFonzo, Mark A., to Kelley Company. Front-of-dock dockboard. 4,501,042, Cl. 14-71.300.
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Van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,502,017, Cl. 330-151.000.
Dimarzio Musical Instrument Pickups: *See*—
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DiNozzi, Robert D.; Vancelette, Stanley R.; Powell, Lionel E.; McLean, George F., Jr.; Sleger, Leon F.; and Mason, Ronald C., to USM Corporation. Micro component assembly machine. 4,501,064, Cl. 29-832.000.
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Di Toro, Vincenzo; Gozzo, Franco; and Boschi, Pier M., to Montedison S.p.A. Process for preparing alkyl esters of C-alkyl-tartronic or C-halogenalkyl-tartronic acids. 4,501,916, Cl. 560-180.000.
Divoky, Ralph A., to California Ceramic Supply Co. Manufacture of inflatable articles. 4,501,545, Cl. 425-275.000.
Dobson, Diane P.; Farrell, Michael J.; and Lutz, Raymond S., to Westinghouse Electric Corp. Dynamoelectric machine with end turn support assembly having fasteners with locking devices. 4,501,985, Cl. 310-270.000.
Dodds, Stephen G., to Chesebrough-Pond's Inc. Shoe construction. 4,501,076, Cl. 36-11.000.
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Dominguez, Edward J. Collapsible door wedge with quick release mechanism. 4,501,444, Cl. 292-342.000.
Domries, Bernard O. Disc type agricultural implement. 4,501,333, Cl. 172-441.000.
Donald, Dennis S.; and Lee, Ross A., to Du Pont de Nemours, E. I., and Company. Phenylmercaptotetrazolo- and nitroindazolo masked development/image modifiers. 4,501,896, Cl. 548-251.000.
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Dondl, Peter, to Siemens Aktiengesellschaft. Telecommunication system with satellites positioned in geostationary positional loops. 4,502,051, Cl. 343-356.000.
Donnelly, Brian G.: *See*—
Perkinson, Robert H.; Donnelly, Brian G.; and Dudash, Carl S., 4,501,157, Cl. 73-861.240.
Dorina Nahmaschinen GmbH: *See*—
Meier, Willi, 4,501,213, Cl. 112-316.000.
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Becker, David A., 4,501,437, Cl. 280-704.000.
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Miller, Ira; Null, Michael W.; and Dotson, Robert N., 4,501,974, Cl. 307-246.000.
Null, Michael W.; Dotson, Robert N.; and Davis, Robert B., 4,501,979, Cl. 307-494.000.
Douglas, Donald J., to MDS Health Group Limited. Method and apparatus for sampling a plasma into a vacuum chamber. 4,501,965, Cl. 250-288.000.
Douklias, Nikolaos, to Siemens Aktiengesellschaft. Method for testing specimens. 4,501,492, Cl. 356-73.100.
Dow Chemical Company, The: *See*—
Hanafin, Joseph W., 4,501,874, Cl. 528-103.000.
Parks, Christ F.; and Nimerick, Kenneth H., 4,501,775, Cl. 427-220.000.
Reierson, Robert L.; Hussey, Hugh F.; and Woo, Edmund P., 4,501,679, Cl. 252-77.000.
Dow Corning Corporation: *See*—
Gee, Ronald P., 4,501,619, Cl. 106-287.120.
Dowbenko, Rostyslaw: *See*—
Singer, Debra L.; McCollum, Gregory J.; and Dowbenko, Rostyslaw, 4,501,854, Cl. 525-162.000.
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Fenton, Edward A., Jr.; Lakin, Ira W.; Stein, Joseph H.; Lohr, John R.; and Schreiber, David A., 4,501,539, Cl. 425-84.000.
Dresser Industries, Inc.: *See*—
Ashley, Michael J.; Hemphill, Paul D.; and Leivo, Charles C., 4,501,722, Cl. 423-242.000.
Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., 4,501,454, Cl. 384-619.000.
Wetterhorn, Richard H.; and Ferguson, Walter J., 4,501,152, Cl. 73-738.000.
Driessen, Antonius J. G. C.; Geertsema, Eise B.; Oomen, Joris J. C.; and Rouwendal, Jan W., to U.S. Philips Corporation. Composite body for gas discharge lamp. 4,501,799, Cl. 428-446.000.
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Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,501,639, Cl. 159-48.100.
Drinkuth, William H.; Bires, Robert J.; Miller, Robert J.; and Selleck, Franklin G., to United Technologies Corporation. Method and apparatus for grinding turbine engine rotor assemblies using dynamic optical measurement system. 4,501,095, Cl. 51-165.720.
Druet, Jean-Pierre, to Societe Lorraine de Laminage Continu SOLLAC. Method and apparatus for the sintering of a mineral using gaseous fuel. 4,501,609, Cl. 75-5.000.
Druker, Harvey A., to McNab Incorporated. Retaining clamp for combination valve and conductivity cell assembly. 4,502,011, Cl. 324-446.000.
Duchesne, Jean-Philippe: *See*—
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Dudash, Carl S.: *See*—
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Dufresne, Pierre; Freund, Edouard; Marcilly, Christian; and Raatz, Francis, to Institut Francais du Petrole. Dewaxing process employing a catalyst with a highly dealuminated mordenite base. 4,501,656, Cl. 208-111.000.
Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Method and apparatus for rearing post-larvae shrimp. 4,501,227, Cl. 119-2.000.
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Duke, Colin C.; and Wells, Robert J., to Hoffmann-La Roche Inc. 2,3-Isopropylidene ribonic acid, 1,4-lactones. 4,501,908, Cl. 549-305.000.
Dumanoir, Jean L.: *See*—
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Duncan, David S., to Wilkinson Sword Limited. Razors and shaving units for razors. 4,501,067, Cl. 30-63.000.
Duncan, James W., to Stencel Aero Engineering Corporation. Apparatus and method for compressing a sleeping bag into a container and the container therefor. 4,501,362, Cl. 206-525.000.
Dunn, William J.: *See*—
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Du Pont de Nemours, E. I., and Company: *See*—
Benin, Joshua; and Luoma, Robert P., II, 4,501,951, Cl. 219-243.000.
Donald, Dennis S.; and Lee, Ross A., 4,501,896, Cl. 548-251.000.
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Heyer, David E., 4,501,712, Cl. 264-101.000.
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O'Brien, John P., 4,501,886, Cl. 536-57.000.
Zahr, George E., 4,501,876, Cl. 528-232.000.

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Dupuis, Jean L., to D. M. International Ltd. Vehicle for a fun-fair or the like. 4,501,434, Cl. 280-206.000.

Dury, Peter L. K., to Nottingham County Council. Playing surfaces sports. 4,501,420, Cl. 272-3.000.

Dussourd d'Hinterland, Lucien; Normier, Gerard; and Pinel, Anne-Marie, to Pierre Fabre S.A. Method of preparing immunostimulant proteoglycans which induce production of interferon, proteoglycans obtained and pharmaceutical compositions containing them. 4,501,693, Cl. 260-112.00R.

Duvois, Eric: *See*—
Jouvet, Adrien; and Duvois, Eric, 4,501,960, Cl. 235-492.000.

Dux, James P.: *See*—
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Dyer, Lawrence D.; and McGregor, Anderson D., to Texas Instruments Incorporated. Kerf loss reduction in internal diameter sawing. 4,501,258, Cl. 125-13.00R.

Dykstra, Richard A. Solid state magneto ignition switching device. 4,501,256, Cl. 123-651.000.

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Nelson, Keith E., 4,501,970, Cl. 250-458.100.

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Breuer, Hermann; Treuner, Uwe D.; and Denzel, Theodor, 4,501,743, Cl. 514-201.000.
Kronenthal, David, 4,501,697, Cl. 260-245.400.
Thottathil, John K.; Moniot, Jerome L.; Floyd, David; and Brandt, Steven, 4,501,901, Cl. 548-532.000.
Wood, Thomas G., 4,501,494, Cl. 356-240.000.

Eagles, Brian A., to Coal Industry (Patents) Limited. Fluid supply for rotary cutter heads for mining machines. 4,501,449, Cl. 299-81.000.

Eastman Kodak Company: *See*—
Adams, L. Jane, 4,501,878, Cl. 528-286.000.
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Romansky, John A.; and Matson, Gary R., 4,501,483, Cl. 355-3.0FU.
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Anderson, Harry B.; and Zalewski, Jack J., 4,501,937, Cl. 200-5.00A.

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Ebisaka, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Differential protective relay. 4,502,086, Cl. 361-87.000.

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Glaser, Eberhard; and Beitinger, Eberhard, 4,501,446, Cl. 299-9.000.

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Edmunds, Neil R., to Gulf Canada Limited. In-situ recovery of viscous hydrocarbonaceous crude oil. 4,501,326, Cl. 166-272.000.

Edwards, Harold W., to Du Pont de Nemours, E. I., and Company. Process for dispersing solids in liquid media. 4,501,501, Cl. 366-336.000.

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Ehara, Kunihiko: *See*—
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Eisai Co., Ltd.: *See*—
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Eisele, Hermann; and Frank, Bruno, to Robert Bosch GmbH. Apparatus for ascertaining control variables in an internal combustion engine. 4,501,248, Cl. 123-478.000.

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Elbe, Hans-Ludwig: *See*—
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Electro-Biology, Inc.: *See*—
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Cannon, William N., 4,501,608, Cl. 71-121.000.
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Lunn, William H. W.; and Vasileff, Robert T., 4,501,739, Cl. 514-203.000.
Nichols, Cynthia L.; and Kornfeld, Edmund C., 4,501,890, Cl. 514-267.000.
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Delmege, Arthur H.; El-Ibiary, Yehia M.; Rode, Melvin A.; and Taplin, Lael B., 4,502,109, Cl. 364-174.000.

Elmore, Carl L.: *See*—
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Eltech Systems Corporation: *See*—
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Endo, Isao; Nagamune, Teruyuki; and Inoue, Ichiro, to Rikagaku Kenkyusho. Autosampler. 4,501,161, Cl. 73-863.240.

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Energy Conversion Devices, Inc.: *See*—
McCormick-Goodhart, Mark H., 4,501,487, Cl. 355-27.000.

Energy Development Associates, Inc.: *See*—
Galloway, James H., 4,502,001, Cl. 320-6.000.
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Engineered Air Systems, Inc.: *See*—
Norton, John P., 4,501,126, Cl. 62-185.000.

Enloe, Kenneth M., to Kimberly-Clark Corporation. Disposable diaper having improved absorbent pad arrangement. 4,501,587, Cl. 604-385.000.

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Ershov, Jury A.: *See*—
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valery A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A., 4,501,320, Cl. 165-144.000.

Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., to United States of America, Air Force. Multiconductor flat cable. 4,501,929, Cl. 174-117.00F.

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Hahn, Frederick C.; and Jones, Larren F., 4,501,079, Cl. 37-141.00R.

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Evans, George S.; Morton, Edward W.; Gilmore, John F., deceased; and by Gilmore, Roderick A., Administrator, to North American Philips Lighting Corp. Energy conserving instant-start series-sequence fluorescent lamp system and fluorescent lamp with overcurrent protection. 4,501,992, Cl. 315-122.000.

Everhart, Cherie H.: *See*—
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Evolution Enterprises, Inc.: *See*—
Straayer, Robert O., 4,501,332, Cl. 172-41.000.

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Exxon Production Research Co.: *See*—
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Boegli, Serge; and Lebet, Jean-Pierre, 4,501,579, Cl. 493-45.000.
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Fujiwara, Kaisaku; Yokooji, Shigenori; and Morishita, Yasuji, to Hitachi, Ltd. Electronic parts-mounting device with easy assembly and maintenance. 4,502,047, Cl. 340-693.000.
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Funk, James E., to Alfred University Research Foundation, Inc. Process for burning a carbonaceous slurry. 4,501,205, Cl. 110-347.000.
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Gallagher, Paul H. Heat reclamation. 4,501,128, Cl. 62-238.600.
Galloway, James H., to Energy Development Associates, Inc. Current balancing for battery strings. 4,502,001, Cl. 320-6.000.
Gann, Steven N. Method and apparatus for use in drill string make up. 4,501,335, Cl. 173-12.000.
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Gaskin, Virginia R.; Horvath, Eugene P.; and Jansson, Richard M., to United States of America, Army. Cryogenic cooler for photoconductive cells. 4,501,131, Cl. 62-514.00R.
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Gerstmann, Joseph; Hauck, William M.; Raymond, Robert; and Swenson, Paul F., Jr., to Consolidated Natural Gas Service Company, Inc. On-board automotive methane compressor. 4,501,253, Cl. 123-527.000.
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Perlman, Marvin; and Goldfine, Milton, 4,501,957, Cl. 235-379.000.
Goldsholl, Morton. Image processor and method for use in making photographic prints. 4,501,488, Cl. 355-46.000.
Goldwasser, David J.: *See—*
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, 4,501,844, Cl. 524-451.000.
Golobay, Gary L. Variable flow reversible vane pump. 4,501,535, Cl. 417-440.000.
Gonner, Siegmar, to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck" . Device for severing round timber. 4,501,178, Cl. 83-107.000.
Goodman, Edward; Dux, James P.; and Albright, Fred R., to Goodman, Edward. Cleaning and protective composition and method. 4,501,682, Cl. 252-174.150.
Goodrich, Calvin O. Sheet music tray for a guitar. 4,501,403, Cl. 248-443.000.
Goodwin, Alan; and Brearley, Malcolm, to Lucas Industries Limited. Displacement measuring transducers and their use for sensing vehicle suspension displacements. 4,502,006, Cl. 324-208.000.
Goodyear Tire & Rubber Company, The: *See—*
Young, Delton W., 4,501,077, Cl. 36-32.00R.
Gordbegli, Manochehr; and An, Sangchol, to Purex Pool Products, Inc. Pool or spa water heater. 4,501,232, Cl. 122-235.00C.
Gordon, Arnold Z.: *See—*
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., 4,501,824, Cl. 502-339.000.
Goss, Raymond W., to Hercules Incorporated. Composition for tufted carpets. 4,501,846, Cl. 524-476.000.
Gottschall, George T. Lightweight reflective belt. 4,501,028, Cl. 2-338.000.
Goulard, Claude; Accettella, Serge; Cathaly-Pretou, Gerard; Fages, Bernard; Jeannin, Daniel; Laloux, Philippe; and Le Fur, Jean, to Centre National de la Recherche Scientifique (CNRS). Multi-partition modular camera for obtaining microfiches. 4,501,489, Cl. 355-54.000.
Gozzo, Franco: *See—*
Di Toro, Vincenzo; Gozzo, Franco; and Boschi, Pier M., 4,501,916, Cl. 560-180.000.
Grace, William R., to Norris Industries Inc. Cooktop ventilation system. 4,501,260, Cl. 126-299.00R.
Gracia, Robert F.: *See—*
Fromson, Howard A.; and Gracia, Robert F., 4,501,810, Cl. 430-302.000.
Graco Inc.: *See—*
Kwok, Kui C., 4,501,394, Cl. 239-296.000.
Lehrke, Kenneth E., 4,501,952, Cl. 219-305.000.
Granda, Edward J.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.
Grandin, Roland E.; and Milligan, Barton, to Air Products and Chemicals, Inc. Aromatic amines from alkali metal amide aminating agent and aromatic. 4,501,922, Cl. 564-408.000.
Graves, Bernard J.; and Kukolja, Stjepan, to Eli Lilly and Company. Cephalosporin antibiotics. 4,501,741, Cl. 514-202.000.
Gray, Michael A., to AT&T Bell Laboratories. Detecting a DC nonlinearity terminating a network. 4,501,935, Cl. 179-175.000.
Gray, Thomas H.: *See—*
Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., 4,501,316, Cl. 164-463.000.
Grealy, Jennifer M.: *See—*
Maurice, Terrence J.; and Grealy, Jennifer M., 4,501,760, Cl. 426-250.000.
Greenawalt, Monte H. Inflatable pillow. 4,501,034, Cl. 5-441.000.
Greene, Howard P., Jr.: *See—*
Clark, Leonard R., Jr.; and Greene, Howard P., Jr., 4,501,569, Cl. 446-458.000.
Greene, Janice L.; and Loza, Roman, to Standard Oil Company, The. Preparation of polyamide by contacting diamine, dinitrile, water, dicarboxylic acid. 4,501,881, Cl. 528-336.000.
Greenhalgh, Wilbur O., to United States of America, Energy. Detection of free liquid in containers of solidified radioactive waste. 4,501,146, Cl. 73-290.00B.
Greenspan, Stephen B.; and Gupta, Omkarnath R., to International Business Machines Corporation. Cooling system with counter flow of coolant. 4,502,100, Cl. 361-384.000.
Gregoli, Armand A., to Cities Service Company. Method of in-situ hydrogenation of carbonaceous material. 4,501,445, Cl. 299-2.000.
Gregory, James H., to Heritage Homes, Inc. Hybrid home construction technique. 4,501,098, Cl. 52-79.100.
Grenier, Aime J., to Texas Instruments Incorporated. Circuit control device. 4,502,033, Cl. 337-75.000.
Griffin, Christopher J.; and Oxborrow, Bernard H., to Metal Box, P.L.C. Multipacks of containers. 4,501,104, Cl. 53-48.000.
Griffin, Gladys B. Specimen slide for analysis of liquid specimens. 4,501,496, Cl. 356-246.000.
Griffith, Joseph E.: *See—*
Frye, Robert C.; Griffith, Joseph E.; and Wong, Yiu H., 4,501,060, Cl. 29-576.00W.
Grill, Benjamin: *See—*
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,501,290, Cl. 137-495.000.
Grimm, Henry J.: *See—*
Frazier, Terry L.; Grimm, Henry J.; Rooney, John F.; Allen, Richard S.; Brown, Alfred; and Mims, Donald S., 4,501,325, Cl. 166-250.000.
Grinstein, Reuben H.: *See—*
Marcellis, Alphonso W.; Johnson, Grannis S.; and Grinstein, Reuben H., 4,501,594, Cl. 44-51.000.
Griswold, Alexandra F.: *See—*
Griswold, Beth H.; Griswold, Gail E.; and Griswold, Alexandra F., 4,501,559, Cl. 434-154.000.
Griswold, Beth H.; Griswold, Gail E.; and Griswold, Alexandra F. Basic comprehensive genealogical and family history system of straightline genealogy. 4,501,559, Cl. 434-154.000.

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Griswold, Beth H.; Griswold, Gail E.; and Griswold, Alexandra F., 4,501,559, Cl. 434-154.000.
Grohmann, Kurt; and Weishaupt, Walter, to Bayerische Motoren Werke AG. Process for determination of the stored quantity of operating fluids for automotive vehicles, and circuit for conducting the process. 4,502,124, Cl. 364-442.000.
Groseck, John B., to Honeywell Inc. Locking and extraction mechanism for rack mounted components. 4,501,455, Cl. 312-215.000.
Groult, Alain; and Samec, Jean, to Colgate-Palmolive Company. Detergent dish-washing composition. 4,501,681, Cl. 252-174.120.
Grundy, Andrew K.; and Versluis, Jan, to Shell Oil Company. Single point mooring system provided with pressure relief means. 4,501,525, Cl. 414-139.000.
Gruppo Lepetit S.p.A.: *See*—
Koch, Melvin V.; and Magni, Ambrogio, 4,501,919, Cl. 562-437.000.
GTE Automatic Electric Incorporated: *See*—
Krikor, Krikor A.; and Hu, Kuang-Cheng, 4,502,114, Cl. 364-200.000.
GTE Products Corporation: *See*—
Huvet, Jean-Marie, 4,502,087, Cl. 361-119.000.
Gulf Canada Limited: *See*—
Edmunds, Neil R., 4,501,326, Cl. 166-272.000.
Gupta, Omkarnath R.: *See*—
Greenspan, Stephen B.; and Gupta, Omkarnath R., 4,502,100, Cl. 361-384.000.
Gustavsson, John K. C.: *See*—
Johansson, Sune H.; and Gustavsson, John K. C., 4,501,198, Cl. 100-98.00R.
Gutner, Kenneth H.; and Waxman, Jay S., to Gutner, Kenneth H. Slide assembly for drawer. 4,501,453, Cl. 308-3.600.
Habeeb, Jacob J., to Exxon Research & Engineering Co. Heterocyclic nitrogen compounds—organometallic salt complexes as corrosion inhibitors in lubricating oils. 4,501,677, Cl. 252-37.200.
Hadermann, Albert F.; Trippe, Jerry C.; and Waters, Paul F., to General Technology Applications,Inc. Dissolving water soluble polymers. 4,501,828, Cl. 523-309.000.
Haffner, William B.: *See*—
Super, Scott S.; Hsu, Joseph C.; Haffner, William B.; and Jesse, Jerry F., 4,501,797, Cl. 428-349.000.
Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; Bolton, Brent C.; and Miner, Robert L., Jr., to Burroughs Corporation. Concurrent network of reduction processors for executing programs stored as tree-like graphs employing variable-free applicative language codes. 4,502,118, Cl. 364-200.000.
Hagge, Melvin L.: *See*—
Gentile, Carmine J.; Hagge, Melvin L.; and Croes, Robert C., 4,501,978, Cl. 307-475.000.
Hagopian, Gary J.: *See*—
Barfield, Gilbert; and Hagopian, Gary J., 4,501,715, Cl. 264-248.000.
Hahn, Frederick C.; and Jones, Larren F., to ESCO Corporation. Two piece cutting edge construction. 4,501,079, Cl. 37-141.00R.
Hahn, Granville J.: *See*—
Rutledge, Raleigh N.; and Hahn, Granville J., 4,501,543, Cl. 425-191.000.
Haider, Ludwig, to Voest-Alpine Aktiengesellschaft. Apparatus for feeding platelike workpieces to a machine tool. 4,501,523, Cl. 414-19.000.
Hain, David A., to NCR Corporation. Sheet handling apparatus. 4,501,416, Cl. 271-3.100.
Hait, James M. Torque driven irrigation system. 4,501,392, Cl. 239-177.00R.
Hakansson, Sven; and Lundh, Bengt, to Axel Johnson Engineering AB. Method and apparatus for removing liquid from a suspension. 4,501,669, Cl. 210-770.000.
Hakko Kouyu Co., Ltd.: *See*—
Suzuki, Katsuhiko; and Naganuma, Seihachi, 4,501,115, Cl. 57-220.000.
Hale, Thomas E., to General Electric Company. Coated product with oxide wear layer. 4,501,786, Cl. 428-215.000.
Hall, Charles P.; and Philipson, Joseph, to Monterey Manufacturing Co. Self-sealing waterbed mattress. 4,501,035, Cl. 5-451.000.
Hall, John B.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.
Halm Instrument Co. Inc.: *See*—
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Halone, William; and Davis, James R. Newspaper dispensing apparatus. 4,501,379, Cl. 221-221.000.
Hamilton, Harriet: *See*—
Trivedi, Bharat; Hamilton, Harriet; and Moos, Walter, 4,501,735, Cl. 514-46.000.
Hammann, Ingeborg: *See*—
Elbe, Hans-Ludwig; and Hammann, Ingeborg, 4,501,753, Cl. 514-447.000.
Hammond, James M.: *See*—
Long, James, 4,501,598, Cl. 55-2.000.
Hamner, Glen P., to Exxon Research & Engineering Co. Production of jet and diesel fuels. 4,501,653, Cl. 208-89.000.
Han, Doyoung, to Trane Company, The. Temperature conditioning system staging control and method. 4,501,125, Cl. 62-175.000.
Hanafin, Joseph W., to Dow Chemical Company, The. 2,3-Epoxy carbamates. 4,501,874, Cl. 528-103.000.
Hannett, William J., to Carrier Corporation. Air conditioning system trouble reporter. 4,502,084, Cl. 361-23.000.
Hansen, Charles W., to Haydon Switch & Instrument, Inc. Return-to-zero stepper motor. 4,501,981, Cl. 310-49.00R.
Hansen, Gerhard. Tear-open closure for a container. 4,501,372, Cl. 215-247.000.
Hanyu, Susumu; and Kato, Kenji, to Janome Sewing Machine Co. Ltd. Electrode control sewing machine. 4,501,210, Cl. 112-158.00E.
Harbuck, Stanley C. Method for reducing hypertension of a liver. 4,501,263, Cl. 128-1.00R.
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., to Eltech Systems Corporation. Catalyst for making chlorine dioxide. 4,501,824, Cl. 502-339.000.
Hargis, Larry N., to Carrier Corporation. Method and apparatus for prolonging sleeve bearing life in a multiple speed rotational device. 4,501,534, Cl. 417-572.000.
Haring, Manfred, to Mannesmann Aktiengesellschaft. Fluidtight pipe joint. 4,501,443, Cl. 285-328.000.
Harnoncourt, Karl: *See*—
Marsoner, Hermann; Harnoncourt, Karl; and List, Helmut, 4,501,296, Cl. 137-625.410.
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., to Allied Corporation. Composite containing polyolefin fiber and polyolefin polymer matrix. 4,501,856, Cl. 525-240.000.
Harris Corporation: *See*—
Carl, Robert H., Jr.; Koontz, Floyd; and Pedtke, Daniel F., 4,502,025, Cl. 333-24.00R.
Riffe, Josephus; and Rice, Richard, 4,502,111, Cl. 364-200.000.
Harris, Martin, to Shell Oil Company. Insecticidal 3-formyl-2-nitromethylene-2H-1,3-thiazine. 4,501,742, Cl. 514-226.000.
Harrison Equipment Co., Inc.: *See*—
McMinn, Robert R., 4,501,982, Cl. 310-90.000.
Harrison, Lynn: *See*—
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,501,290, Cl. 137-495.000.
Harshaw/Filtrol Partnership: *See*—
Mitrofanov, Nicholas M.; and Berner, Victor G., 4,501,988, Cl. 313-93.000.
Hart, Daniel W.; and Hart, Helen F. High heel angle mast stay release structure. 4,501,215, Cl. 114-39.000.
Hart, Helen F.: *See*—
Hart, Daniel W.; and Hart, Helen F., 4,501,215, Cl. 114-39.000.
Hart, John E. Purified water dispensing machine. 4,501,381, Cl. 222-2.000.
Hart, William D.: *See*—
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Harwood, Jon W., to APX Group, Inc. Air gap pipe. 4,501,302, Cl. 138-113.000.
Hasegawa, Junzo: *See*—
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, 4,501,141, Cl. 73-146.000.
Hashimoto, Kenji: *See*—
Inada, Masami; and Hashimoto, Kenji, 4,501,298, Cl. 137-625.480.
Hashimoto, Shigeru: *See*—
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Hata, Hideo: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,501,634, Cl. 156-244.240.
Hauck, William M.: *See*—
Gerstmann, Joseph; Hauck, William M.; Raymond, Robert; and Swenson, Paul F., Jr., 4,501,253, Cl. 123-527.000.
Haukelt, Helmut: *See*—
Paersch, Michael; Mrotzek, Herbert; Haukelt, Helmut; and Schreckenberg, Heinz-Wilhelm, 4,501,593, Cl. 44-23.000.
Haupt, Herbert, to International Standard Electric Corporation. Process for manufacturing glass fiber optical waveguides. 4,501,601, Cl. 65-2.000.
Hayashi, Shuukichi: *See*—
Omori, Norio; Tabe, Tsutomu; Ito, Katsunori; and Hayashi, Shuukichi, 4,501,250, Cl. 123-486.000.
Hayashi, Yoshinobu: *See*—
Yuguchi, Hiroya; Hayashi, Yoshinobu; and Miyazaki, Yusuke, 4,501,763, Cl. 426-573.000.
Haydon Switch & Instrument, Inc.: *See*—
Hansen, Charles W., 4,501,981, Cl. 310-49.00R.
Heath Company: *See*—
Cubbage, William R., 4,501,458, Cl. 339-17.00L.
Heath, Robert B.; and Nagel, Colin M., to Rainsfords Metal Products Pty. Ltd. Child restraint bassinet. 4,501,032, Cl. 5-94.000.
Hebert, Alfred. Oil filter. 4,501,660, Cl. 210-209.000.
Hebrank, William H. Heat recovery and air preheating apparatus. 4,501,318, Cl. 165-1.000.
Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Stabilized olefin polymers. 4,501,838, Cl. 524-108.000.
Heckler & Koch GmbH: *See*—
Brandl, Rudolf; and Doll, Herbert, 4,501,189, Cl. 89-14.400.
Heil, Richard W.; and Rose, Thomas A. Method and apparatus for treating organic wastewater. 4,501,664, Cl. 210-614.000.
Hein, Klaus R. G.: *See*—
Gebhard, Georg R. U.; and Hein, Klaus R. G., 4,501,618, Cl. 106-109.000.
Heinlein, Hans. Closure cap, in particular for bottle-like containers, having an element assuring intactness. 4,501,373, Cl. 215-252.000.

Heitzmann, Michel, to Thomson-CSF. Method of fabricating a varactor/oscillator diode module for a tunable oscillator. 4,502,023, Cl. 331-107.00R.
Held, Peter J. Air deflector. 4,501,195, Cl. 98-103.000.
Helix Technology Corporation: *See*—
Holland, Noel J., 4,501,120, Cl. 62-6.000.
Hemphill, Paul D.: *See*—
Ashley, Michael J.; Hemphill, Paul D.; and Leivo, Charles C., 4,501,722, Cl. 423-242.000.
Henk, Charles R. Skimmer apparatus for swimming pools. 4,501,659, Cl. 210-169.000.
Henkel Corporation: *See*—
Morris, Charles A., 4,501,758, Cl. 426-93.000.
Henscheid, Thomas H.: *See*—
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Herberg, Helmut, to Siemens Aktiengesellschaft. FET Controlled thyristor. 4,502,071, Cl. 357-38.000.
Herberg, Helmut, to Siemens Aktiengesellschaft. FET Controlled thyristor. 4,502,072, Cl. 357-38.000.
Herbert Kannegiesser GmbH & Co.: *See*—
Wiebesiek, Wilhelm, 4,501,529, Cl. 414-751.000.
Herbert, William G., to Xerox Corporation. Electroforming process. 4,501,646, Cl. 204-4.000.
Hercules Incorporated: *See*—
Desmarais, Armand J., 4,501,617, Cl. 106-93.000.
Goss, Raymond W., 4,501,846, Cl. 524-476.000.
Herring, Liles G., 4,501,841, Cl. 524-411.000.
Keim, Gerald I., 4,501,862, Cl. 525-430.000.
Heritage Homes, Inc.: *See*—
Gregory, James H., 4,501,098, Cl. 52-79.100.
Herring, Liles G., to Hercules Incorporated. Elastomeric insulating materials for rocket motors. 4,501,841, Cl. 524-411.000.
Hewlett-Packard Company: *See*—
Murphy, John B., 4,501,300, Cl. 138-46.000.
Rankin, Glenn H.; and Levie, Harold W., 4,502,060, Cl. 346-140.00R.
Heyer, David E., to Du Pont de Nemours, E. I., and Company. Vacuum pinning of molten thermoplastic film to a roughened casting roll. 4,501,712, Cl. 264-101.000.
Hibi, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Position discrimination device for a thumb wheel switch. 4,502,050, Cl. 340-870.010.
Hickham, John H. Two tray indirect bonding system for labial and lingual brackets. 4,501,554, Cl. 433-24.000.
Hickling, Robert L.: *See*—
Garcia, R. F.; and Hickling, Robert L., 4,502,127, Cl. 364-900.000.
Hieber, Konrad; and Wieczorek, Claudia, to Siemens Aktiengesellschaft. Method for selective deposition of layer structures consisting of silicides of HMP metals on silicon substrates and products so-formed. 4,501,769, Cl. 427-95.000.
Higashi, Robert E.; Johnson, Robert G.; and Bohrer, Philip J., to Honeywell Inc. Flow sensor. 4,501,144, Cl. 73-204.000.
Higginbottom, Harold P., to Monsanto Company. Polymerizable compositions comprising polyamines and poly(dihydrobenzoxazines). 4,501,864, Cl. 525-484.000.
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, to Nippon Steel Corporation. Hydrated chromium oxide-coated steel strip useful for welded cans and other containers. 4,501,802, Cl. 428-629.000.
Hilbig, Josef: *See*—
Kornrumpf, Wolfgang; Perplies, Eberhard; Hilbig, Josef; and Felcht, Utz-Hellmuth, 4,501,887, Cl. 536-84.000.
Hilfman, Lee; and O'Hara, Mark J., to UOP Inc. Hydrocracking process. 4,501,655, Cl. 208-110.000.
Hill, James J.; and Marven, Al, to Cook International, Inc. Tilt valve. 4,501,409, Cl. 251-354.000.
Hill, John P.; and Touchton, James J., to Storage Technology Corporation. Constant bandwidth automatic gain control system. 4,502,021, Cl. 330-279.000.
Hillmann, Hans; and Springer, Engelbert, to Vacuumschmelze GmbH. Stabilized super-conductor having a diffusion-inhibiting layer therein and method of producing same. 4,501,062, Cl. 29-599.000.
Hilti Aktiengesellschaft: *See*—
Bergner, Arndt, 4,501,520, Cl. 411-21.000.
Hiltz, Dale V., to Keeler Brass Company. Furniture article with compression hub for joining radial members. 4,501,512, Cl. 403-170.000.
Hinds, Philbirt F. Incubator with pyramidal top portion. 4,501,228, Cl. 119-37.000.
Hini, Eugen: *See*—
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Hinkhouse, Lysle R.: *See*—
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Hinn, Werner; and Fecht, Hans-Rudolf, to RCA Corporation. Noise suppressing interface circuit in a kinescope bias control system. 4,502,073, Cl. 358-10.000.
Hinoto, Yuji: *See*—
Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,501,801, Cl. 428-447.000.
Hiragami, Yoshiaki; Yabu, Mikio; and Kawaguchi, Yozi, to Toyo Linoleum Company, Limited. Non-slip floor material. 4,501,783, Cl. 428-147.000.
Hirai, Masaharu: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.
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Hiraishi, Shigetoshi; Morishita, Sadao; and Matsushita, Toshihiko, to Mitsubishi Paper Mills, Ltd. Photosetting microcapsules and photo- and pressure-sensitive recording sheet. 4,501,809, Cl. 430-138.000.
Hirakawa, Tadashi; and Yoshida, Makoto, to Teijin Limited. Process for producing paper or non-woven fabric. 4,501,641, Cl. 162-164.300.
Hirano, Shigeo; and Sakanoue, Kei, to Fuji Photo Film Co., Ltd. Photographic development inhibitor (1H- or 2H-) indazolyl hydroquinone derivatives. 4,501,898, Cl. 548-336.000.
Hirasawa, Kazuo: *See*—
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Hirotsuka, Motohiko; and Kito, Makoto, to Fuji Oil Company, Limited. Phosphorylated soybean protein. 4,501,694, Cl. 260-123.500.
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Fujiwara, Katsuhiro; and Osako, Kazuyoshi, 4,502,112, Cl. 364-200.000.
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Hitco: *See*—
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,501,037, Cl. 8-149.200.
Hiyama, Tamejiro; and Kobayashi, Kazuhiro, to Sagami Chemical Research Center. Aminopolyol derivatives. 4,501,909, Cl. 549-342.000.
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Rogers, Robert M.; Treiber, Fritz F.; and Bowers, Russell E., 4,501,105, Cl. 53-64.000.
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Hobbs, Richard S.: *See*—
Johnson, Robert W.; and Hobbs, Richard S., 4,501,563, Cl. 441-6.000.
Hobson, James C., to Ex-Cell-O Corporation. Rack and pinion weapon elevation mechanism. 4,501,190, Cl. 89-41.00H.
Hodek, Robert B.; and Seiner, Jerome A., to PPG Industries, Inc. Property enhancement of anionically polymerized nylon with dual initiators. 4,501,821, Cl. 502-155.000.
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Kornrumpf, Wolfgang; Perplies, Eberhard; Hilbig, Josef; and Felcht, Utz-Hellmuth, 4,501,887, Cl. 536-84.000.
Schmidt, Hans-Joachim; and Arpe, Hans-Jurgen, 4,501,917, Cl. 560-187.000.
Spietschka, Ernst; and Troster, Helmut, 4,501,906, Cl. 549-232.000.
Hofer, Gerald: *See*—
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Hoffman, Edward C. Soap saving device. 4,501,354, Cl. 206-77.100.
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Duke, Colin C.; and Wells, Robert J., 4,501,908, Cl. 549-305.000.

Holland, Noel J., to Helix Technology Corporation. Refrigeration system with clearance seals. 4,501,120, Cl. 62-6.000.

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Holmes, Rory A.; and Sun, Eleanor, to Chicopee. Operating room gown and drape fabric. 4,501,792, Cl. 428-299.000.

Holtman, Dennis C., to Personal Products Company. Absorbent structure with reservoir. 4,501,586, Cl. 604-380.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Toki, Susumu; and Nagahiro, Kenichi, 4,501,234, Cl. 123-41.860.
Yoshida, Takao, 4,501,340, Cl. 180-219.000.

Honda, Tetsuzo: *See*—
Nioh, Susumu; Hirayama, Hiroshi; Honda, Tetsuzo; and Ishida, Koji, 4,501,773, Cl. 427-213.000.

Honeywell Inc.: *See*—
Groseck, John B., 4,501,455, Cl. 312-215.000.
Higashi, Robert E.; Johnson, Robert G.; and Bohrer, Philip J., 4,501,144, Cl. 73-204.000.
Stauffer, Norman L., 4,501,961, Cl. 250-201.000.

Honeywell Information Systems Inc.: *See*—
Morgan, Thomas A., 4,501,054, Cl. 29-235.000.

Honeywell Information Systems Italia: *See*—
Vercesi, Arturo; and Marzocca, Francesco, 4,502,039, Cl. 340-365.00S.

Hongo, Hironobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Selected beam marking system for rapid ultrasound measurements. 4,501,277, Cl. 128-660.000.

Honig, Ernst-August, to Volkswagenwerk Aktiengesellschaft. Fluid delivery control device for an automatic transmission. 4,501,173, Cl. 74-868.000.

Honma, Ichiro: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.

Hood, Rush W., Jr., to Critikon, Inc. Automatic identification of cuff size in automated blood pressure monitors. 4,501,280, Cl. 128-677.000.

Hook, Wolfgang, to Deere & Company. Protective cover assembly for a grease fitting. 4,501,572, Cl. 464-170.000.

Hori, Hiromi: *See*—
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, 4,501,626, Cl. 148-36.000.

Horiba, Ltd.: *See*—
Ebi, Hiroyuki; and Miyatake, Kimio, 4,501,968, Cl. 250-343.000.

Horig, Joachim; and Schultheiss, Hartmut, to Ferring Arzneimittel GmbH. Polypeptides, a process for their preparation, their use, and a process for the purification of polypeptides. 4,501,733, Cl. 514-17.000.

Horike, Masanori; and Ishikawa, Chuji, to Ricoh Company, Ltd. Ink jet deaeration apparatus. 4,502,055, Cl. 346-75.000.

Horton, John E.: *See*—
Wechter, William J.; and Horton, John E., 4,501,754, Cl. 514-456.000.

Horvath, Eugene P.: *See*—
Gaskin, Virginia R.; Horvath, Eugene P.; and Jansson, Richard M., 4,501,131, Cl. 62-514.00R.

Hosaka, Hiroshi: *See*—
Ogata, Takashi; Hosaka, Hiroshi; and Kasai, Shunichi, 4,501,666, Cl. 210-688.000.

Hosaka, Tomiharu: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,501,686, Cl. 252-500.000.

Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, to Sony Corporation; and Hosiden Electronics Co., Ltd. Three-piece multi-connector. 4,501,465, Cl. 339-176.0MP.

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Hough, Thomas L.; and Jones, Graham P., to FBC Limited. Herbicidal heterocyclic compounds and compositions. 4,501,605, Cl. 71-90.000.

Hoyer, Francis L. E., to Societe Anonyme des Usines Chausson. Method for brazing heat exchanger cores by blowing hot gases. 4,501,387, Cl. 228-183.000.

Hoyt, John G. Spinnaker pole control. 4,501,217, Cl. 114-102.000.

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Tamura, Jun; Matsui, Takahiro; and Hozumi, Kazuo, 4,501,557, Cl. 433-79.000.

Hsu, Joseph C.; Vought, Donald W.; and Walbrun, George H., to American Can Company. Heat resistant heat shrinkable film. 4,501,779, Cl. 428-35.000.

Hsu, Joseph C.: *See*—
Super, Scott S.; Hsu, Joseph C.; Haffner, William B.; and Jesse, Jerry F., 4,501,797, Cl. 428-349.000.

Hu, Kuang-Cheng: *See*—
Krikor, Krikor A.; and Hu, Kuang-Cheng, 4,502,114, Cl. 364-200.000.

Huang, Ray C., to Deere & Company. Bulldozer track support roller mounting. 4,501,452, Cl. 305-27.000.

Huang, Tien T. Tire pressure gauge. 4,501,142, Cl. 73-146.800.

Hughes Tool Company: *See*—
Lively, F. Glenn; and Robison, Kenneth O., 4,501,323, Cl. 166-250.000.

Hummel, Kurt: *See*—
Merges, Veit; and Hummel, Kurt, 4,501,469, Cl. 350-611.000.

Humphrey Products Company: *See*—
Klimowicz, Michael A.; Toliusis, Vytautas J.; and Loveless, Stanley M., 4,501,299, Cl. 137-625.650.

Hunt, William C.: *See*—
Rickert, David W.; Wilkinson, Richard A., Jr.; and Hunt, William C., 4,502,136, Cl. 369-271.000.

Hunter, Edwin J., to Toro Company, The. Hose end pattern sprinkler. 4,501,391, Cl. 239-97.000.

Huson, Gale W.: *See*—
Urban, Clement A.; and Huson, Gale W., 4,501,356, Cl. 206-83.500.

Hussey, Hugh F.: *See*—
Reierson, Robert L.; Hussey, Hugh F.; and Woo, Edmund P., 4,501,679, Cl. 252-77.000.

Hussey, James H.: *See*—
Bauer, Carl F.; Hussey, James H.; Langston, Benny; and Parikh, Niranjan M., 4,501,614, Cl. 75-257.000.

Hutschenreuther Aktiengesellschaft: *See*—
Strobel, Klaus; and Geiger, Klaus, 4,501,714, Cl. 264-245.000.

Huvet, Jean-Marie, to GTE Products Corporation. Surge voltage arrester assembly. 4,502,087, Cl. 361-119.000.

Hyltin, Tom M.; Milner, Thomas G.; and Frye, Elam C., Jr., to Personal Peripherals Inc. Digital joystick controller. 4,501,939, Cl. 200-6.00A.

I & K Trading Company: *See*—
Nagaoka, Muneo, 4,501,568, Cl. 446-450.000.

Iannelli, Frank M. Housing for a pressurized syrup package. 4,501,383, Cl. 222-82.000.

Iato, Michel: *See*—
Castel, Yvon; and Iato, Michel, 4,501,056, Cl. 29-252.000.

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Idemitsu Kosan Company Limited: *See*—
Katayama, Takao; and Takesue, Masahiko, 4,501,678, Cl. 252-32.70E.

Igarashi, Masaru: *See*—
Takahashi, Yuji; Masaki, Hisaji; Adachi, Muneo; and Igarashi, Masaru, 4,501,419, Cl. 271-288.000.

Ignatuk, Wayne R.; and Plocic, Frank M., to Litton Systems, Inc. Apparatus for preparing an optical workpiece. 4,501,091, Cl. 51-102.000.

Iimure, Tamio, to Nippon Paint Co., Ltd. Multicoat forming method. 4,501,767, Cl. 427-44.000.

Iiyama, Kiyotaka: *See*—
Taniguchi, Keishi; and Iiyama, Kiyotaka, 4,502,068, Cl. 346-216.000.

Ikuma, Masahiro, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup device for stringed musical instrument. 4,501,186, Cl. 84-1.160.

Ikuzawa, Masanori: *See*—
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.

Illinois Tool Works Inc.: *See*—
Lombardi, Edward J., 4,501,276, Cl. 128-642.000.

Illmann, Joachim; and Fullgraf, Heribert, to Varta Batterie Aktiengesellschaft. Clamping element for storage battery plate stacks. 4,501,413, Cl. 269-43.000.

Imai, Ryusaku: *See*—
Ohya, Nobumasa; Imai, Ryusaku; and Sato, Hitoshi, 4,501,931, Cl. 178-18.000.

Imamura, Tetsuya: *See*—
Takeuchi, Takashi; Kobayashi, Syoji; Ootani, Tsuyoshi; and Imamura, Tetsuya, 4,501,795, Cl. 428-329.000.

Imazeki, Kazuyoshi; and Wani, Hisashi, to General Research of Electronics, Inc. Signal distributing apparatus. 4,502,026, Cl. 333-101.000.

Imose, Masayuki; Seno, Takao; and Sakaguchi, Yoshihito, to Chugai Ro Co., Ltd. Floating equipment and floating-type heat treating furnace for striplike works. 4,501,553, Cl. 432-59.000.

Ina, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Cooling apparatus for machinery. 4,501,123, Cl. 62-119.000.

Inaba, Ritsuo: *See*—
Mitsuyu, Tsuneo; Ono, Shusuke; Inaba, Ritsuo; and Wasa, Kiyotaka, 4,501,987, Cl. 310-313.00A.

Inada, Masami; and Hashimoto, Kenji, to Aisin Seiki Kabushiki Kaisha. Solenoid actuated valve device. 4,501,298, Cl. 137-625.480.

Incom International, Inc.: *See*—
Tracy, Wayne R., 4,501,351, Cl. 198-648.000.

Industrial Automation Corp.: *See*—
Peyton, John J.; and Watt, Bryan K., 4,501,365, Cl. 209-548.000.

Industrial Electronic Rubber Company: *See*—
Murray, Myles N., 4,501,407, Cl. 251-141.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Brescia, Riccardo; Buat, Mario; Dagna, Giandomenico; and Scardovi, Alessandro, 4,502,054, Cl. 346-75.000.

Ing. Gunter Knapp Ges. mbH & Co. KG: *See*—
Knapp, Gunter, 4,501,528, Cl. 414-273.000.

Ingenieurburo Dipl.-Ing. Hermann Kunst: *See*—
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Ingersoll-Rand Company: *See*—
Fenemore, Keith E.; Foden, George P.; and Baker, Christopher J., 4,501,973, Cl. 290-1.00A.

Inkrott, Janet L.: *See*—
Sherk, Fred T.; and Inkrott, Janet L., 4,501,885, Cl. 528-501.000.

Inoue, Ichiro: *See*—
Endo, Isao; Nagamune, Teruyuki; and Inoue, Ichiro, 4,501,161, Cl. 73-863.240.

Institut Francais du Petrole: *See—*
Dufresne, Pierre; Freund, Edouard; Marcilly, Christian; and Raatz, Francis. 4,501,656, Cl. 208-111.000.
Institutul de Cercetari Pentru Industria Electro-Tehnica-Icpe: *See—*
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International Business Machines Corporation: *See—*
Acciai, Michael; Pigos, Charles R.; and Speicher, Charles G., 4,502,063, Cl. 346-155.000.
Greenspan, Stephen B.; and Gupta, Omkarnath R., 4,502,100, Cl. 361-384.000.
Kumar, Ananda H., 4,501,768, Cl. 427-57.000.
Yamaguchi, Hidefumi, 4,501,996, Cl. 315-371.000.
International Flavors & Fragrances Inc.: *See—*
Klemarczyk, Philip T., 4,501,918, Cl. 500-231.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,501,904, Cl. 549-35.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.
International Harvester Co.: *See—*
Boyd, Collis E., 4,501,532, Cl. 417-313.000.
McCandless, James C., 4,501,138, Cl. 73-116.000.
Thedford, Guy N.; Fachini, Robert M.; and Sullivan, Dennis K., 4,501,112, Cl. 56-13.300.
International Paint Public Limited Company: *See—*
Reeder, Frank; Nunn, Michael J.; Mitchell, Michael J.; and Baxter, Kenneth F., 4,501,615, Cl. 106-14.390.
International Paper Company: *See—*
Cassidy, Benjamin J., 4,501,388, Cl. 229-37.00R.
International Remote Imaging Systems: *See—*
De Forest, Sherman E.; Bolz, Gunner; and La Quey, Robert E., 4,502,075, Cl. 358-93.000.
International Research & Development Company: *See—*
Moorhouse, Peter, 4,501,676, Cl. 252-12.000.
International Standard Electric Coporation: *See—*
von der Brake, Dieter, 4,501,989, Cl. 313-93.000.
International Standard Electric Corporation: *See—*
Bergersen, Hans A.; and Risberg, Eilif, 4,501,956, Cl. 219-553.000.
Blomley, Peter F., 4,502,018, Cl. 330-254.000.
Haupt, Herbert, 4,501,601, Cl. 65-2.000.
International Telephone and Telegraph Corporation: *See—*
Anhalt, John W., 4,501,461, Cl. 339-75.00M.
Reed, Robert E., 4,502,029, Cl. 333-203.000.
Iomega Corporation: *See—*
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,502,083, Cl. 360-99.000.
Iquad Company Incorporated: *See—*
Potter, John T., 4,501,508, Cl. 400-141.100.
Irwin, Charles; Devine, Janet; and Kramer, Richard, to Sonobond Ultrasonics, Inc. Ultrasonic cleaning apparatus. 4,501,285, Cl. 134-58.00R.
Isbey, Edward K., Jr. Surgical kit. 4,501,363, Cl. 206-570.000.
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, to Pioneer Electronic Corporation. FM Stereo demodulator for demodulating stereo signals directly from an FM intermediate frequency signal. 4,502,148, Cl. 381-7.000.
Ishida, Koji: *See—*
Nioh, Susumu; Hirayama, Hiroshi; Honda, Tetsuzo; and Ishida, Koji, 4,501,773, Cl. 427-213.000.
Ishida, Takashi, to Nissan Motor Company, Limited. Supporting assembly for a suspension. 4,501,436, Cl. 280-666.000.
Ishihara Sangyo Kaisha, Ltd.: *See—*
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.
Ishikawa, Chuji: *See—*
Horike, Masanori; and Ishikawa, Chuji, 4,502,055, Cl. 346-75.000.
Ishikawa, Shozo: *See—*
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Ishikawa, Tsuneo: *See—*
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.
Ishitobi, Masami, to Dainichi-Nippon Cables, Ltd. Shielding tape and electric cables using same. 4,501,928, Cl. 174-107.000.
Ishiyama, Shozo: *See—*
Fujita, Hisao; and Ishiyama, Shozo, 4,501,475, Cl. 350-427.000.
Ishizuka, Yutaka, to Diesel Kiki Co., Ltd. Vane compressor having an endless camming surface minimizing torque fluctuations. 4,501,537, Cl. 418-150.000.
Isomae, Kazuo: *See—*
Yokoi, Koichi; Tachibana, Koichi; Isomae, Kazuo; and Nakashima, Toshiaki, 4,501,752, Cl. 514-414.000.
Itai, Masahiro: *See—*
Furuno, Nobuo; Ota, Yoshio; Itai, Masahiro; Tokuyama, Akio; and Nakano, Eiichi, 4,501,649, Cl. 204-181.00R.
Itec, Inc.: *See—*
Atkinson, Roger F., 4,502,049, Cl. 340-825.730.
Ito, Haruhiko; and Sano, Mineo, to Mitsubishi Denki Kabushiki Kaisha. Electromagnet and method of producing the same. 4,502,031, Cl. 335-277.000.
Ito, Katsunori: *See—*
Omori, Norio; Tabe, Tsutomu; Ito, Katsunori; and Hayashi, Shuukichi, 4,501,250, Cl. 123-486.000.
Itoh, Hiroshi: *See—*
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, 4,501,223, Cl. 118-668.000.
Itoh, Masaki, to Kawasaki Jukogyo Kabushiki Kaisha. Device for mounting container box on motorcycle. 4,501,384, Cl. 224-32.00A.
Itou, Takeo: *See—*
Watanabe, Shingo; and Itou, Takeo, 4,501,806, Cl. 430-25.000.
ITT Industries, Inc.: *See—*
Giebel, Burkhard, 4,502,131, Cl. 365-201.000.
Weiler, Rolf; and Muller, Reiner, 4,501,410, Cl. 251-366.000.
Iwai, Takafusa: *See—*
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, 4,501,626, Cl. 148-36.000.
Iwasaki, Takao: *See—*
Kidoh, Kunizoh; Wakamori, Hideki; Suzuki, Fujio; and Iwasaki, Takao, 4,501,870, Cl. 526-344.100.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Doi, Akiho; and Saneyoshi, Norio, 4,502,138, Cl. 370-100.000.
Matsufuji, Teruo, 4,502,139, Cl. 370-110.200.
Iwata, Satoshi, to Iwata, Tetsutaro. Compound die assembly. 4,501,179, Cl. 83-124.000.
Iwata, Tadao: *See—*
Nagano, Riichiro; Kiga, Hiroshi; and Iwata, Tadao, 4,501,827, Cl. 523-214.000.
Iwata, Tetsutaro: *See—*
Iwata, Satoshi, 4,501,179, Cl. 83-124.000.
Iwayama, Akira: *See—*
Matsui, Kanenobu; Uchiumi, Shinichiro; Iwayama, Akira; and Umezu, Takashi, 4,501,705, Cl. 260-465.600.
Izumi, Masahiko. Method of heat exchange and refrigerating devices. 4,501,121, Cl. 62-78.000.
Izumi, Masahiko. Refrigerating device. 4,501,130, Cl. 62-247.000.
Izumi, Michael T. Dry fire unit. 4,501,081, Cl. 42-1.00R.
J. M. Voith, GmbH: *See—*
Jenkner, Karl; Steiner, Karl; and Wolf, Robert, 4,501,075, Cl. 34-125.000.
Jackson, G. C., Jr.: *See—*
Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., 4,501,454, Cl. 384-619.000.
Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., to Amjo, Inc. Dryer and printed material and the like. 4,501,072, Cl. 34-1.000.
Jacoby, Hans-Dieter; and Schmidt, Peter, to Ernst Leitz Wetzlar GmbH. Device for automatically transporting disk shaped objects. 4,501,527, Cl. 414-225.000.
Jagenberg AG: *See—*
Zodrow, Rudolf; and Buchholz, Rainer, 4,501,633, Cl. 156-242.000.
Jahnel, Werner F. F., to Bekum Plastics Machinery Inc. Label transferring device for blow molding machines. 4,501,548, Cl. 425-503.000.
Jaime, Gil: *See—*
Peisker, Glenn; Christiansen, Keith; and Jaime, Gil, 4,501,431, Cl. 277-134.000.
Jannemann, Theo: *See—*
Sommers, Hans; and Jannemann, Theo, 4,501,127, Cl. 62-238.300.
Janome Sewing Machine Co. Ltd.: *See—*
Hanyu, Susumu; and Kato, Kenji, 4,501,210, Cl. 112-158.00E.
Janome Sewing Machine Industry Co., Ltd.: *See—*
Suzuki, Ryoichi; and Yamaguchi, Yoshio, 4,501,588, Cl. 8-444.000.
Suzuki, Ryoichi; and Yamaguchi, Yoshio, 4,501,590, Cl. 8-495.000.
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Van Der Ploeg, Arie; Jansen, Wim; and Gerson, Philips, 4,501,255, Cl. 123-557.000.
Jansson, Richard M.: *See—*
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Jardat, Alain; and Andre , Joel, to Societe Nationale Industrielle Aerospatiale. Apparatus for cutting by means of a high pressure fluid jet. 4,501,182, Cl. 83-177.000.
Jarrett, Boaz A.; Fenne, Ivor; Lakin, David F.; and Mowbray, Dorian F., to Lucas Industries Public Limited Company. Fuel injection pumping apparatus. 4,501,244, Cl. 123-446.000.
Jean Walterscheid GmbH: *See—*
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Jeannin, Daniel: *See—*
Goulard, Claude; Accettella, Serge; Cathaly-Pretou, Gerard; Fages, Bernard; Jeannin, Daniel; Laloux, Philippe; and Le Fur, Jean, 4,501,489, Cl. 355-54.000.
Jeffcoat, Keith: *See—*
Flavell, John; Jeffcoat, Keith; and Betts, Max W., 4,501,132, Cl. 66-64.000.
Jenkner, Karl; Steiner, Karl; and Wolf, Robert, to J. M. Voith, GmbH. Apparatus for removing condensate from a steam heated rotatable drying cylinder and the like. 4,501,075, Cl. 34-125.000.
JEOL Ltd.: *See—*
Ohuchi, Muneki, 4,502,008, Cl. 324-311.000.
Jesse, Jerry F.: *See—*
Koschak, Matthew; Super, Scott S.; and Jesse, Jerry F., 4,501,798, Cl. 428-349.000.
Super, Scott S.; Hsu, Joseph C.; Haffner, William B.; and Jesse, Jerry F., 4,501,797, Cl. 428-349.000.
Jessee, Ralph D., to Westinghouse Electric Corp. Inverter firing control with pulse averaging error compensation. 4,502,105, Cl. 363-41.000.
Jiles, Stephen L. Pipe thread gauging tool. 4,501,070, Cl. 33-199.00R.

Jodoin, Raymond C., to Rogers Corporation. Decoupled integrated circuit package. 4,502,101, Cl. 361-386.000.
Johansson, Arne, to A/S Nunc. Method of sealing a tubular receptacle. 4,501,108, Cl. 53-440.000.
Johansson, Sune H.; and Gustavsson, John K. C., to Magnus Wilhelm AB. Device for compressing in particular aluminum cans. 4,501,198, Cl. 100-98.00R.
Johnson, Charles E.: *See*—
Dean, Weibley J.; Johnson, Charles E.; and Ragard, Phillip A., 4,501,183, Cl. 83-233.000.
Johnson, Daniel D., to Du Pont de Nemours, E. I., and Company. Liquid chemical process for forming conductive through-holes through a dielectric layer. 4,501,638, Cl. 156-644.000.
Johnson, Grannis S.: *See*—
Marcellis, Alphonso W.; Johnson, Grannis S.; and Grinstein, Reuben H., 4,501,594, Cl. 44-51.000.
Johnson Matthey Public Limited Company: *See*—
Thomson, Alasdair I.; and King, Frank, 4,501,685, Cl. 502-167.000.
Johnson, Michael K. Force transducer. 4,501,160, Cl. 73-862.650.
Johnson, Robert G.: *See*—
Higashi, Robert E.; Johnson, Robert G.; and Bohrer, Philip J., 4,501,144, Cl. 73-204.000.
Johnson, Robert W.; and Hobbs, Richard S. Marker buoy. 4,501,563, Cl. 441-6.000.
Jones, Adrian D. Low frequency muffler. 4,501,341, Cl. 181-250.000.
Jones, Graham P.: *See*—
Hough, Thomas L.; and Jones, Graham P., 4,501,605, Cl. 71-90.000.
Jones, James H.: *See*—
Baldwin, John J.; Jones, James H.; and Lundell, George F., 4,501,900, Cl. 548-436.000.
Jones, Larren F.: *See*—
Hahn, Frederick C.; and Jones, Larren F., 4,501,079, Cl. 37-141.00R.
Joos, Eugen: *See*—
Gassler, Hermann; Joos, Eugen; Kubach, Hans; Maisch, Wolfgang; and Singer, Erich, 4,501,247, Cl. 123-453.000.
Josefowitz, Max: *See*—
Kuhl, Wilhelm; Kiefer, Dieter; and Josefowitz, Max, 4,501,430, Cl. 277-59.000.
Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. Josephson junction latch circuit. 4,501,975, Cl. 307-277.000.
Jouvet, Adrien; and Duvois, Eric, to Motorola, Inc. Micropackage for identification card. 4,501,960, Cl. 235-492.000.
Jujo Paper Co., Ltd.: *See*—
Satake, Toshimi; Maruyama, Kazuo; and Fujimura, Fumio, 4,502,066, Cl. 346-209.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,501,339, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, 4,501,626, Cl. 148-36.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Yoan, Toyohiko; and Muto, Norishige, 4,501,524, Cl. 414-22.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Tamura, Jun; Matsui, Takahiro; and Hozumi, Kazuo, 4,501,557, Cl. 433-79.000.
Kabushiki Kaisha Niida Seisakusho: *See*—
Seyama, Tuneo, 4,501,211, Cl. 112-169.000.
Kabushiki Kaisha Ohara Kogaku Garasu Seizosho: *See*—
Yatsuda, Hisao; and Miyazaki, Mutsumi, 4,501,819, Cl. 501-61.000.
Kabushiki Kaisha Sato: *See*—
Matsuda, Yasuhiko, 4,502,056, Cl. 346-76.0PH.
Shibayama, Tooru; Kajiya, Hiroshi; and Takahashi, Mitsuharu, 4,501,224, Cl. 118-697.000.
Kabushiki Kaisha Tajima Seisakusho: *See*—
Kohno, Seiji, 4,501,069, Cl. 30-293.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,501,940, Cl. 200-16.00A.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, 4,501,141, Cl. 73-146.000.
Kageyama, Junichi: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,501,634, Cl. 156-244.240.
Kajiya, Hiroshi: *See*—
Shibayama, Tooru; Kajiya, Hiroshi; and Takahashi, Mitsuharu, 4,501,224, Cl. 118-697.000.
Kajiya, Seitaro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.
Kako, Hiroyoshi; Kobayashi, Nobuo; and Kaneyuki, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Insert molding device. 4,501,540, Cl. 425-116.000.
Kakuta, Toshio: *See*—
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,501,465, Cl. 339-176.0MP.
Kalkbrenner, Ralph W.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Wolfe, Donald L., 4,501,949, Cl. 219-121.0LC.
Kam, Sheung-Tsam: *See*—
Matier, William L.; and Kam, Sheung-Tsam, 4,501,912, Cl. 560-66.000.
Kamada, Minoru: *See*—
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, 4,501,802, Cl. 428-629.000.
Kamoshita, Katsuzo: *See*—
Kato, Toshiro; Takahashi, Junya; and Kamoshita, Katsuzo, 4,501,756, Cl. 514-120.000.
Kamyr, Inc.: *See*—
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., 4,501,721, Cl. 423-27.000.
Kanada, Eiji: *See*—
Saikawa, Masahiko; Kanada, Eiji; Tanaka, Akira; and Endo, Kazunaka, 4,501,811, Cl. 430-204.000.
Kanbe, Junichiro: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,501,807, Cl. 430-57.000.
Kane, James G.; Pedicano, Ernest A.; and Pedicano, James. Foot and leg exercising device. 4,501,421, Cl. 272-96.000.
Kaneko, Takashi: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,501,634, Cl. 156-244.240.
Kanesaki, Nobukazu: *See*—
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Kanesaki, Nobukazu, 4,501,140, Cl. 73-119.00A.
Kaneyuki, Toshiaki: *See*—
Kako, Hiroyoshi; Kobayashi, Nobuo; and Kaneyuki, Toshiaki, 4,501,540, Cl. 425-116.000.
Kang, Jung W.: *See*—
Roggeman, David M.; Malani, Shrikant R.; and Kang, Jung W., 4,501,866, Cl. 526-133.000.
Kanno, Tetuo: *See*—
Suzaki, Masayuki; and Kanno, Tetuo, 4,501,509, Cl. 400-157.200.
Kano, Hideo: *See*—
Tatemoto, Masayoshi; Oka, Masahiko; Kano, Hideo; Tomoda, Masayasu; and Ueta, Yutaka, 4,501,869, Cl. 526-249.000.
Kao Corporation: *See*—
Takeuchi, Takashi; Kobayashi, Syoji; Ootani, Tsuyoshi; and Imamura, Tetsuya, 4,501,795, Cl. 428-329.000.
Kaplan, Jean-Pierre; and George, Pascal, to Synthelabo. Anxiolytic imidazo[1,2-a]pyridine derivatives. 4,501,745, Cl. 514-222.000.
Karasawa, Akira: *See*—
Muto, Kenji; Karasawa, Akira; Kuroda, Tokuyuki; and Nakamizo, Nobuhiro, 4,501,748, Cl. 514-318.000.
Karasawa, Masafusa. Method and apparatus for purification and activation of water. 4,501,661, Cl. 210-223.000.
Karol, Thomas J.; and Sung, Rodney L., to Texaco Inc. Detergent fuel composition containing alkenylsuccinimide oxamides. 4,501,597, Cl. 44-63.000.
Karol, Thomas J.: *See*—
Sung, Rodney L.; and Karol, Thomas J., 4,501,595, Cl. 44-57.000.
Karr, Gerald W.; and Muller, Gernot, to Beloit Corporation. Supercalender edge nip relieving. 4,501,197, Cl. 100-35.000.
Kartavtsev, Viktor M.: *See*—
Bukhteev, Pavel I.; Posleider, Grigory Y.; Kartavtsev, Viktor M.; and Bytsak, Vladimir S., 4,501,059, Cl. 29-564.500.
Kasai, Shunichi: *See*—
Ogata, Takashi; Hosaka, Hiroshi; and Kasai, Shunichi, 4,501,666, Cl. 210-688.000.
Kasper, Robin: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Flash photographing system. 4,501,481, Cl. 354-413.000.
Katayama, Takao; and Takesue, Masahiko, to Idemitsu Kosan Company Limited. Lubricants for improving fatigue life. 4,501,678, Cl. 252-32.70E.
Kato, Ken-ichi: *See*—
Ueno, Susumu; Kuroda, Kouiti; Kitamura, Hajime; Tohkai, Masaie; Kato, Ken-ichi; and Hiraishi, Nobuyuki, 4,501,428, Cl. 277-12.000.
Kato, Kenji: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,501,210, Cl. 112-158.00E.
Kato, Masahisa: *See*—
Miyazaki, Hiroshi; and Kato, Masahisa, 4,501,207, Cl. 112-66.000.
Kato, Masami; and Yoshikai, Noriaki, to Nippon Telegraph & Telephone Public Corporation. Consecutive identical digit suppression system in a digital communication system. 4,502,143, Cl. 371-57.000.
Kato, Tadaaki: *See*—
Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,737, Cl. 514-167.000.
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.
Kato, Toshiro; Takahashi, Junya; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Fungicidal carbamates useful against fungi resistant to benzamidazole fungicides. 4,501,756, Cl. 514-120.000.
Katoh, Haruhisa, to Canon Kabushiki Kaisha. System for checking an electrical connection between a computer and a printer. 4,502,113, Cl. 364-200.000.
Katsura, Tadahiko; Hirota, Kazumi; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Easily-openable heat-seal lid. 4,501,375, Cl. 220-270.000.
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, to Thomas Jefferson University. Artificial larynx. 4,502,150, Cl. 381-70.000.

Kavesh, Sheldon: *See*—
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., 4,501,856, Cl. 525-240.000.

Kawaguchi, Yozi: *See*—
Hiragami, Yoshiaki; Yabu, Mikio; and Kawaguchi, Yozi, 4,501,783, Cl. 428-147.000.

Kawakami, Hidehiko: *See*—
Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, 4,502,081, Cl. 358-280.000.

Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,501,998, Cl. 318-568.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,502,108, Cl. 364-170.000.

Kawamura, Toshihiko: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.

Kawamura, Yoshihisa: *See*—
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Kanesaki, Nobukazu, 4,501,140, Cl. 73-119.00A.

Kawano, Junji; and Takahashi, Fumio, to Shinko Electric Co., Ltd. Method and apparatus for detecting errors in an ink ribbon in a thermal transfer type multicolor printer. 4,502,057, Cl. 346-76.0PH.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Itoh, Masaki, 4,501,384, Cl. 224-32.00A.

Kawauchi, Masahiko, to Alps Electric Co., Ltd. Keyboard switch. 4,501,938, Cl. 200-5.00A.

Kawazura, Hiroshi: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.

Keck, Donald B.: *See*—
Borrelli, Nicholas F.; Keck, Donald B.; Morse, David L.; and Sachenik, Paul A., 4,501,468, Cl. 350-96.250.

Keeler Brass Company: *See*—
Hiltz, Dale V., 4,501,512, Cl. 403-170.000.

Keeton, J. Herbert. Construction of fly pieces for men's briefs. 4,501,209, Cl. 112-121.120.

Keim, Gerald I., to Hercules Incorporated. Wet strength resin from aminopolyamide-polyureylene. 4,501,862, Cl. 525-430.000.

Kelch, Heinz, to Kienzle Apparate GmbH. Booster pump arrangement for feeding a secondary circulation system in the operative system of a diesel engine. 4,501,251, Cl. 123-495.000.

Kelley Company: *See*—
DiFonzo, Mark A., 4,501,042, Cl. 14-71.300.

Kelley, John A. Medicine bottle closure having an indicator. 4,501,370, Cl. 215-219.000.

Kemp, Billy W.; and Brashear, William S. Method and apparatus of a self-aligning sleeve for the correction of the direction of deviated boreholes. 4,501,336, Cl. 175-61.000.

Kendall Company, The: *See*—
Cianci, James P.; and Dunn, William J., 4,501,584, Cl. 604-322.000.

Kennecott Corporation: *See*—
Logan, Russell J.; and Glass, Arthur J., 4,501,177, Cl. 83-105.000.

Kerlin, Jack H. Electric arc unbalance correction system. 4,501,947, Cl. 219-68.000.

Kersen, Matthew F.: *See*—
Uherek, Vladimir; and Kersen, Matthew F., 4,501,344, Cl. 187-29.00R.

Kessel, Jason H.; and Alperin, Henry, to West End and Hub Spring Company. Bed frame having swivel bracket for headboard mounting. 4,501,033, Cl. 5-200.00R.

Kholin, Boris G., to Sumskoi Filial Kharkovskogo Politekhnicheskogo Instituta. Orienting attachment to ball throwing machine. 4,501,257, Cl. 124-81.000.

Kibler, Charles E. Riding spurs. 4,501,110, Cl. 54-83.00R.

Kidoh, Kunizoh; Wakamori, Hideki; Suzuki, Fujio; and Iwasaki, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Fine particles of polyvinyl chloride and process for producing the same. 4,501,870, Cl. 526-344.100.

Kiefer, Dieter: *See*—
Kuhl, Wilhelm; Kiefer, Dieter; and Josefowitz, Max, 4,501,430, Cl. 277-59.000.

Kienzle Apparate GmbH: *See*—
Kelch, Heinz, 4,501,251, Cl. 123-495.000.

Kiernan, Jane A.: *See*—
Baker, Pamela K.; and Kiernan, Jane A., 4,501,751, Cl. 514-374.000.

Kiga, Hiroshi: *See*—
Nagano, Riichiro; Kiga, Hiroshi; and Iwata, Tadao, 4,501,827, Cl. 523-214.000.

Kihara, Jyun-ichi, to Tokyo Shibaura Denki Kabushiki Kaisha. DMA Bus load varying unit. 4,502,117, Cl. 364-200.000.

Kikuchi, Yoshiki: *See*—
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,502,065, Cl. 346-204.000.

Kim, Yung J.: *See*—
Anderson, David M.; and Kim, Yung J., 4,501,440, Cl. 285-47.000.

Kimberly-Clark Corporation: *See*—
Enloe, Kenneth M., 4,501,587, Cl. 604-385.000.
Soerens, Dave A., 4,501,640, Cl. 162-111.000.

Kimura, Minoru; and Takahashi, Hisamitsu, to Mitsubishi Denki Kabushiki Kaisha. Ebullition cooled transformer. 4,502,032, Cl. 336-58.000.

Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, to Sony Corporation; and Shin-Etsu Chemical Co., Ltd. Magnetic recording medium. 4,501,801, Cl. 428-447.000.

Kimura, Tadashi, to Olympus Optical Co., Ltd. Microscope objective. 4,501,474, Cl. 350-414.000.

Kinch, Michael A.: *See*—
Tregilgas, John H.; Beck, Jeffrey D.; Kinch, Michael A.; and Schaake, Herbert F., 4,501,625, Cl. 148-20.300.

King, Frank: *See*—
Thomson, Alasdair I.; and King, Frank, 4,501,685, Cl. 502-167.000.

Kinneging, Hans: *See*—
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,501,639, Cl. 159-48.100.

Kinoshita, Kenzi: *See*—
Niimi, Yukihide; Kinoshita, Kenzi; and Urushidani, Masahiro, 4,501,243, Cl. 123-440.000.

Kish, Lewis L.: *See*—
Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., 4,501,316, Cl. 164-463.000.

Kishimoto, Tsuneo: *See*—
Aizawa, Makoto; Kishimoto, Tsuneo; and Tanimoto, Yoshio, 4,501,790, Cl. 428-283.000.

Kishimoto, Yasushi; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for hydrogenation of polymer. 4,501,857, Cl. 525-338.000.

Kistner, Werner: *See*—
Wuhrl, Arno; and Kistner, Werner, 4,502,042, Cl. 340-568.000.

Kitada, Akira, to Fuji Photo Film Co., Ltd. Radiographic intensifying screen. 4,501,796, Cl. 428-337.000.

Kitamura, Hajime: *See*—
Ueno, Susumu; Kuroda, Kouiti; Kitamura, Hajime; Tohkai, Masaie; Kato, Ken-ichi; and Hiraishi, Nobuyuki, 4,501,428, Cl. 277-12.000.

Kitaoka, Yoshitaka: *See*—
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, 4,501,223, Cl. 118-668.000.

Kito, Makoto: *See*—
Hirotsuka, Motohiko; and Kito, Makoto, 4,501,694, Cl. 260-123.500.

Kiuchi, Seiji, to Fuji Photo Film Co., Ltd. Method of splicing a magnetic recording tape and a leader tape. 4,501,630, Cl. 156-159.000.

Kiuru, Rainer, to Valmet Oy. Apparatus for cutting and guiding the marginal lead-in strip of paper web. 4,501,643, Cl. 162-286.000.

Kleczkowski, S. Peter: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,502,083, Cl. 360-99.000.

Klees, Garry W.; and Wright, Charles P., to Boeing Company, The. Internally ventilated noise suppressor with large plug nozzle. 4,501,393, Cl. 239-265.130.

Klemarczyk, Philip T., to International Flavors & Fragrances Inc. Substituted methyl isopropyl oxocyclohexane derivatives, organoleptic uses thereof and process for preparing same. 4,501,918, Cl. 500-231.000.

Klimowicz, Michael A.; Toliusis, Vytautas J.; and Loveless, Stanley M., to Humphrey Products Company. Plunger-type valve. 4,501,299, Cl. 137-625.650.

Klockner-Humboldt-Deutz AG: *See*—
Nolte, Albert; and Wallenfang, Gerd, 4,501,241, Cl. 123-367.000.

Knapp, Gunter, to Ing. Gunter Knapp Ges. mbH & Co. KG. System for automatic stacking, storage and withdrawal of packaged merchandise in large warehouses. 4,501,528, Cl. 414-273.000.

Knodel, Erich, to Walter Graf u. Co GmbH & Co. Piston for precision dosing instrument. 4,501,192, Cl. 92-248.000.

Knowles, James. Composite wood beam and method of making same. 4,501,102, Cl. 52-690.000.

Knowles, Michael R.: *See*—
Boucher, Richard C.; Gatzy, John T.; and Knowles, Michael R., 4,501,729, Cl. 424-45.000.

Kobayashi, Kazuhiro: *See*—
Hiyama, Tamejiro; and Kobayashi, Kazuhiro, 4,501,909, Cl. 549-342.000.

Kobayashi, Nobuo: *See*—
Kako, Hiroyoshi; Kobayashi, Nobuo; and Kaneyuki, Toshiaki, 4,501,540, Cl. 425-116.000.

Kobayashi, Syoji: *See*—
Takeuchi, Takashi; Kobayashi, Syoji; Ootani, Tsuyoshi; and Imamura, Tetsuya, 4,501,795, Cl. 428-329.000.

Koch, Melvin V.; and Magni, Ambrogio, to Gruppo Lepetit S.p.A. Process for the production of serine derivatives. 4,501,919, Cl. 562-437.000.

Kocks Technik GmbH & Co.: *See*—
Staat, Karl-Hans; and Moltner, Hermann, 4,501,134, Cl. 72-8.000.

Koenig, Lawrence W.: *See*—
Morrison, Heber J.; and Koenig, Lawrence W., 4,502,085, Cl. 361-56.000.

Koepke, Jeffery W.: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,501,925, Cl. 585-467.000.

Koerner, Gotz; and Weitemeyer, Christian, to Th. Goldschmidt AG. Organosilicon-modified polydienes, process for their synthesis and their use as emulsion breakers for crude oil. 4,501,911, Cl. 556-446.000.

Koerner, Gotz: *See*—
Fink, Hans-Ferdi; Koerner, Gotz; and Freiberger, Rolf, 4,501,616, Cl. 106-38.220.

Koga, Kenji: *See*—
Terashima, Shiro; Tamoto, Katsumi; and Koga, Kenji, 4,501,700, Cl. 260-351.500.
Kohno, Seiji, to Kabushiki Kaisha Tajima Seisakusho. Cutter for wall papers. 4,501,069, Cl. 30-293.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fanuc Ltd. System for stopping spindle at commanded position. 4,501,999, Cl. 318-632.000.
Koike, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. AND-OR logic circuit including a feedback path. 4,501,977, Cl. 307-469.000.
Kojima, Tadashi: *See*—
Nishikawa, Meisei; Nagumo, Masahide; and Kojima, Tadashi, 4,502,024, Cl. 332-9.00R.
Kolt, Stanley, to Suroff, Leonard W., a part interest. Automatic damper assembly. 4,501,389, Cl. 236-49.000.
Kondo, Mitsushige; Okada, Kazuo; and Hirasawa, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Optical disc signal reproducing system with tilt immunization. 4,502,134, Cl. 369-46.000.
Konig, Joachim; Suling, Carlhans; and Korte, Siegfried, to Bayer Aktiengesellschaft. Polymerization process. 4,501,865, Cl. 526-71.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Naoto; Akimoto, Hidetoshi; and Nomori, Hiroyuki, 4,501,621, Cl. 134-17.000.
Fujita, Hisao; and Ishiyama, Shozo, 4,501,475, Cl. 350-427.000.
Konno, Junichi; Ueda, Yukihiro; Niitsuma, Hiroaki; and Chubachi, Noriyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Micro fracture detector. 4,501,149, Cl. 73-587.000.
Konrad, Mathias, to Jean Walterscheid GmbH. Adjustable friction clutch. 4,501,570, Cl. 464-48.000.
Konrath, Karl: *See*—
Stumpp, Gerhard; Vogtmann, Hans-Jorg; Fussner, Paul; Schwarz, Manfred; Hofer, Gerald; Konrath, Karl; Straubel, Max; and Faupel, Werner, 4,501,252, Cl. 123-502.000.
Koontz, Floyd: *See*—
Carl, Robert H., Jr.; Koontz, Floyd; and Pedtke, Daniel F., 4,502,025, Cl. 333-24.00R.
Koopman, Donald E.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,501,503, Cl. 374-162.000.
Kopp, Ernst, to Skischuhfabrik Dynafit Gesellschaft m.b.H. Skiing boot. 4,501,078, Cl. 36-121.000.
Koppel, Gary A.: *See*—
Barton, Russell L.; Briggs, Stephen L.; and Koppel, Gary A., 4,501,703, Cl. 260-455.00R.
Kornfeld, Edmund C.: *See*—
Nichols, Cynthia L.; and Kornfeld, Edmund C., 4,501,890, Cl. 514-267.000.
Kornrumpf, Wolfgang; Perplies, Eberhard; Hilbig, Josef; and Felcht, Utz-Hellmuth, to Hoechst Aktiengesellschaft. Preparing cellulose ethers in a dimethoxyethane/(dispersing auxiliary) medium. 4,501,887, Cl. 536-84.000.
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Kushida, Hideo; Takahashi, Sumio; and Koshio, Shuichi, 4,501,781, Cl. 428-35.000.
Koto, Haruhiko, to Shinshu Seiki Kabushiki Kabushiki Kaisha Suwa Seikosha. Low voltage ink-jet printhead. 4,502,058, Cl. 346-140.00R.
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Kraus, Charles E., to Excelermatic Inc. Hydraulic speed control arrangement for an infinitely variable transmission. 4,501,172, Cl. 74-867.000.
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Krikor, Krikor A.; and Hu, Kuang-Cheng, to GTE Automatic Electric Incorporated. Circuit for reliable data transfer between two central processing units. 4,502,114, Cl. 364-200.000.
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Kronenthal, David, to E. R. Squibb & Sons, Inc. 4-[[(Amidomethyl)oxy]methyl]-2-oxo-1-azetidinesulfonic acid salts. 4,501,697, Cl. 260-245.400.
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Nicholas, James A.; and Krukowski, Richard, 4,501,148, Cl. 73-379.000.
Krumkalns, Eriks V., to Eli Lilly and Company. N,N-disubstituted carboxamide derivatives, and fungicidal use thereof. 4,501,746, Cl. 514-357.000.
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Gassler, Hermann; Joos, Eugen; Kubach, Hans; Maisch, Wolfgang; and Singer, Erich, 4,501,247, Cl. 123-453.000.
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Kubota, Shigeo, to Sony Corporation. Apparatus for detecting a position of an optical pickup. 4,501,493, Cl. 356-123.000.
Kuckes, Arthur F., to Gearhart Industries, Inc. Apparatus including a magnetometer having a pair of U-shaped cores for extended lateral range electrical conductivity logging. 4,502,010, Cl. 324-338.000.
Kuckuk, William R., to Square D Company. Removable memory package, associated apparatus and method of use. 4,502,130, Cl. 365-52.000.
Kuhl, Wilhelm; Kiefer, Dieter; and Josefowitz, Max, to Deutsche Babcock Werke Aktiengesellschaft. Means of sealing off the inside of a pulverizer. 4,501,430, Cl. 277-59.000.
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Buhlmann, Ulrich, 4,501,707, Cl. 261-94.000.
Kuki, Takakuni, to Nippon Electric Co., Ltd. Circuit for checking bit errors in a received BCH code succession by the use of primitive and non-primitive polynomials. 4,502,141, Cl. 371-37.000.
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Graves, Bernard J.; and Kukolja, Stjepan, 4,501,741, Cl. 514-202.000.
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Synergistic antimicrobial compositions. 4,501,732, Cl. 424-114.000.
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Kumar, Ananda H., to International Business Machines Corporation. Thin film floating zone metal coating technique. 4,501,768, Cl. 427-57.000.
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Kuno, Akira; and Shinoda, Yoshio, to Nippon Soken, Inc. Speed control method and system for automotive vehicles. 4,501,284, Cl. 123-352.000.
Kunst, Hermann, to Technomed Elektromed. Apparatebau GmbH; and Ingenieurburo Dipl.-Ing. Hermann Kunst. Apparatus for recording data on a recording carrier. 4,502,062, Cl. 346-155.000.
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Bouboulis, Constantine J.; and Kuntz, Irving, 4,501,868, Cl. 526-208.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kidoh, Kunizoh; Wakamori, Hideki; Suzuki, Fujio; and Iwasaki, Takao, 4,501,870, Cl. 526-344.100.
Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,737, Cl. 514-167.000.
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.
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Kuroda, Tokuyuki: *See*—
Muto, Kenji; Karasawa, Akira; Kuroda, Tokuyuki; and Nakamizo, Nobuhiro, 4,501,748, Cl. 514-318.000.
Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch Inc. Method for autotransfusion of blood. 4,501,581, Cl. 604-52.000.
Kusaka, Iwao, to Babcock-Hitachi Kabushiki Kaisha. Heat recovery steam generator. 4,501,233, Cl. 122-406.00S.
Kushida, Hideo; Takahashi, Sumio; and Koshio, Shuichi, to Yoshino Kogyosho Co., Ltd. Bottle-shaped container. 4,501,781, Cl. 428-35.000.

Kuusikko, Matti J.; and Rantala, Olavi K., to Outokumpu Oy. Apparatus for conveying a solid or liquid material, especially for charging a shaft furnace. 4,501,526, Cl. 414-173.000.
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Tsutsui, Osamu; Murakami, Shusaku; Kuwahara, Hidehiko; and Yasunaga, Shigefumi, 4,501,261, Cl. 126-351.000.
Kuznetsov, Vsevolod V.: *See*—
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Kuznetsova, Svetlana M.: *See*—
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valery A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A., 4,501,320, Cl. 165-144.000.
Kuznetz, Lawrence. Composite fabric for sportswear. 4,501,025, Cl. 2-243.00A.
Kwentus, Gerald K.; and Suda, Michael, to Monsanto Company. Maleic anhydride production using high butane feed concentration. 4,501,907, Cl. 549-259.000.
Kwok, Kui C., to Graco Inc. Spray gun air cap and method of making. 4,501,394, Cl. 239-296.000.
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Muto, Kenji; Karasawa, Akira; Kuroda, Tokuyuki; and Nakamizo, Nobuhiro, 4,501,748, Cl. 514-318.000.
L. & C. Steinmuller GmbH: *See*—
Leikert, Klaus, 4,501,206, Cl. 110-347.000.
L & F Industries: *See*—
Chivens, David E.; and Cloward, Laramie J., 4,501,135, Cl. 72-302.000.
Lakin, David F.: *See*—
Jarrett, Boaz A.; Fenne, Ivor; Lakin, David F.; and Mowbray, Dorian F., 4,501,244, Cl. 123-446.000.
Lakin, Ira W.: *See*—
Fenton, Edward A., Jr.; Lakin, Ira W.; Stein, Joseph H.; Lohr, John R.; and Schreiber, David A., 4,501,539, Cl. 425-84.000.
Laloux, Philippe: *See*—
Goulard, Claude; Accettella, Serge; Cathaly-Pretou, Gerard; Fages, Bernard; Jeannin, Daniel; Laloux, Philippe; and Le Fur, Jean, 4,501,489, Cl. 355-54.000.
Lambach, Heinrich W., to Brdr. Schur International A/S. Folding box. 4,501,364, Cl. 206-626.000.
Lamoine, Pierre R., to U.S. Philips Corporation. Device for safety-locking a cover of a housing of a magazine of a camera and camera in which such a device is utilized. 4,501,479, Cl. 354-275.000.
Landa, Benzion, to Savin Corporation. Wiper blade for electrophotocopier. 4,501,486, Cl. 355-15.000.
Landgraf, Helmut, to Mannesmann Aktiengesellschaft. Wrapping steel pipes in a thermoplastic ribbon. 4,501,632, Cl. 156-187.000.
Landoni, Giannino, to Meca S.a.s. di Cagnoni Landoni S.C. Process for the bidirectional feeding of fabrics in quilting machines, and a machine utilizing this process. 4,501,208, Cl. 112-118.000.
Landwehrkamp, Hans; and Schneider, Gottfried, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Thread paraffining device employing a thread element. 4,501,221, Cl. 118-78.000.
Lane, Ernest, to American Hospital Supply Corporation. Method of leaflet attachment for prosthetic heart valves. 4,501,030, Cl. 3-1.500.
Langston, Benny: *See*—
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Lapeyre, Fernand S. Multi-speed transmission for BMX bicycles and the like. 4,501,575, Cl. 474-74.000.
LaPierre, Rene B.; Partridge, Randell D.; Chen, Nai Y.; and Wong, Steven S., to Mobil Oil Corporation. Catalytic dewaxing process with zeolite beta. 4,501,926, Cl. 585-739.000.
Lapsker, Irving: *See*—
Cerny, Frank T.; and Lapsker, Irving, 4,501,347, Cl. 188-250.00G.
La Quey, Robert E.: *See*—
De Forest, Sherman E.; Bolz, Gunner; and La Quey, Robert E., 4,502,075, Cl. 358-93.000.
Larson, David A.: *See*—
Morrell, Roger J.; and Larson, David A., 4,501,448, Cl. 299-67.000.
Lathlaen, Richard A.: *See*—
Bell, Robert L.; and Lathlaen, Richard A., 4,501,051, Cl. 29-25.410.
Lau, John R.: *See*—
Geho, W. Blair; and Lau, John R., 4,501,728, Cl. 424-38.000.
Lavi, Jukka: *See*—
Lovgren, Timo; and Lavi, Jukka, 4,501,813, Cl. 435-8.000.
Lavielle, Gilbert: *See*—
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Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., to Hitco. Method for introducing heat-sensitive material into a hot environment. 4,501,037, Cl. 8-149.200.
Lazzery, Angelo G.: *See*—
Siryj, Bohdan W.; and Lazzery, Angelo G., 4,502,133, Cl. 369-34.000.
Le, Quang N.; and Neuman, Daniel J., to Mobil Oil Corporation. Process for selective removal of CCR, arsenic and conjugated diolefins from shale oil. 4,501,652, Cl. 208-57.000.
Leake, Bernard W., to Raytheon Company. Programmable two-port microwave network. 4,502,028, Cl. 333-109.000.
Lebet, Jean-Pierre: *See*—
Boegli, Serge; and Lebet, Jean-Pierre, 4,501,579, Cl. 493-45.000.
le Bigot, Yves: *See*—
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Leblanc, Jean, to Robert Bosch GmbH. Fuel injection pump. 4,501,246, Cl. 123-449.000.
Lee, Ross A.: *See*—
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Lehmann, Hartmut, to Womako Maschinenkonstruktionen GmbH. Apparatus for looping the outermost convolutions of spiral binders for note books or the like. 4,501,304, Cl. 140-103.000.
Lehrke, Kenneth E., to Graco Inc. Electric fluid heater temperature control system providing precise control under varying conditions. 4,501,952, Cl. 219-305.000.
Leikert, Klaus, to L. & C. Steinmuller GmbH. Method of igniting a pulverized-coal pilot-burner flame. 4,501,206, Cl. 110-347.000.
Leipold, Ludwig; Stengl, Jens P.; and Tihanyi, Jeno , to Siemens Aktiengesellschaft. FET Controlled thyristor. 4,502,070, Cl. 357-38.000.
Leivo, Charles C.: *See*—
Ashley, Michael J.; Hemphill, Paul D.; and Leivo, Charles C., 4,501,722, Cl. 423-242.000.
Lell, Rainer, to Davy McKee AG. Process for the combustion of H_2S containing gases. 4,501,725, Cl. 423-573.00R.
Leon, Harry I. Threading die couple. 4,501,519, Cl. 408-101.000.
Leonardo, Ignazio, to Diamond Communication Products, Inc. Cableclamp. 4,501,400, Cl. 248-74.100.
Leonhard, Kurt: *See*—
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Le Parquier, Guy; and Puech, Claude, to Thomson-CSF. Analog-digital optical conversion process and apparatus. 4,502,037, Cl. 340-347.0AD.
Lescrenier, Charles: *See*—
Michaels, Terry J., 4,502,147, Cl. 378-206.000.
Leshik, Edward A. Apparatus for playing a game of skill. 4,501,422, Cl. 273-1.0GC.
Letron GmbH: *See*—
Siry, Manfred; and Diesel, Hans-Dieter, 4,501,635, Cl. 156-273.300.
Lever Brothers Company: *See*—
Gercama, Anne; and Schijf, Robert, 4,501,764, Cl. 426-607.000.
Levie, Harold W.: *See*—
Rankin, Glenn H.; and Levie, Harold W., 4,502,060, Cl. 346-140.00R.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal triazine sulfonamides. 4,501,607, Cl. 71-93.000.
Levy, Claude; and Duchesne, Jean-Philippe. Packing, in particular for transporting and dispatching products, for example biological products. 4,501,360, Cl. 206-443.000.
Lewin, Ian H.; Plummer, Michael J.; and Ward, Rodney, to U.S. Philips Corporation. Electrostatic chuck. 4,502,094, Cl. 361-234.000.
Lewis, John C., to Park-Ohio Industries, Inc. Method and apparatus for uniform induction heating of an elongated workpiece. 4,501,942, Cl. 219-10.430.
LGT Laboratoire General des Telecommunications: *See*—
Cluniat, Claude; and Delattre, Joseph, 4,502,076, Cl. 358-160.000.
LGZ Landis & Gyr Zug AG: *See*—
Antes, Gregor, 4,501,439, Cl. 283-91.000.
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Liebregts, Antonius M. J.: *See*—
Bulten, Eric J.; and Liebregts, Antonius M. J., 4,501,702, Cl. 260-429.00R.
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valesy A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A. Multiflow tubular air heater. 4,501,320, Cl. 165-144.000.
Lisner, Herbert; and Michalak, Peter, to Brown, Boveri & Cie AG. Method and apparatus for determining the angle between the air-gap flux vector and the stator current vector of an asynchronous machine fed from an intermediate current-link frequency converter. 4,502,005, Cl. 324-158.0MG.
List, Helmut: *See*—
Marsoner, Hermann; Harnoncourt, Karl; and List, Helmut, 4,501,296, Cl. 137-625.410.
Litton Bionetics, Inc.: *See*—
Pandey, Ramesh C.; Toussaint, Margaret W.; McGuire, Jeffrey C.; and Thomas, Monica C., 4,501,699, Cl. 260-351.100.
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Ignatuk, Wayne R.; and Plocic, Frank M., 4,501,091, Cl. 51-102.000.
Lively, F. Glenn; and Robison, Kenneth O., to Hughes Tool Company. Method and apparatus for monitoring the corrosive effects of well fluids. 4,501,323, Cl. 166-250.000.
Lockheed Corporation: *See*—
Sanders, Richard L., 4,501,176, Cl. 81-470.000.
Sandorff, Paul E., 4,501,398, Cl. 244-134.00R.
Lockheed Electronics Company, Inc.: *See*—
Csengery, Ladislao C., 4,502,142, Cl. 371-55.000.
Loebach, Michael H., to Motter Printing Press Co. Balanced deflection gripper for sheet handling equipment. 4,501,415, Cl. 270-60.000.
Logan, Russell J.; and Glass, Arthur J., to Kennecott Corporation. Edge trimming and scrap disposal system. 4,501,177, Cl. 83-105.000.
Logsdon, Gary L.: *See*—
Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; Bolton, Brent C.; and Miner, Robert L., Jr., 4,502,118, Cl. 364-200.000.

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Fenton, Edward A., Jr.; Lakin, Ira W.; Stein, Joseph H.; Lohr, John R.; and Schreiber, David A., 4,501,539, Cl. 425-84.000.
Loichinger, Fred A.; and Thomson, Meredith C. Process vat cutting and stirring mechanism. 4,501,196, Cl. 99-461.000.
Lombardi, Edward J., to Illinois Tool Works Inc. Fetal electrode apparatus. 4,501,276, Cl. 128-642.000.
Long, Delmar D., to Dayco Corporation. Elastomer-coated bias reinforcement fabric and method for producing same. 4,501,771, Cl. 427-176.000.
Long, James, to Hammond, James M., a part interest. Gas borne particle filtering method. 4,501,598, Cl. 55-2.000.
Longton, John: *See*—
Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., 4,501,765, Cl. 426-656.000.
Loomis, Jester M., III, to United States of America, Army. Hybrid monopulse/sequential lobing beamrider guidance. 4,501,399, Cl. 244-3.130.
Lotz, Horst K., to Aute Gesellschaft fur autogene Technik mbH. Flame-cutter employing a discontinuous oxygen supply for billets produced in a continuous caster. 4,501,624, Cl. 148-9.00R.
Loukos, Isaias, to Pennsylvania Engineering Corporation. Method and apparatus for cleaning waste gases from aluminum production facilities. 4,501,599, Cl. 55-71.000.
Lovas, Kurt: *See*—
Schuller, Edmund; Mayer, Walter; Hini, Eugen; Bock, Erich; and Lovas, Kurt, 4,501,116, Cl. 57-263.000.
Loveless, Stanley M.: *See*—
Klimowicz, Michael A.; Toliusis, Vytautas J.; and Loveless, Stanley M., 4,501,299, Cl. 137-625.650.
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Loweg, Heribert: *See*—
Schulze, Hans-Horst; Loweg, Heribert; and Schneider, Karl-Heinz, 4,501,044, Cl. 15-312.00R.
Lowenthal, Richard W.; Seike, Stephen C.; and Walsh, Gregory V., to Convergent Technologies, Inc. Keyboard scanning and interface method and circuit. 4,502,038, Cl. 340-365.00S.
Lowes, John M., to British Underwater Pipeline Engineering. Securing of structures to the sea-bed. 4,501,514, Cl. 405-227.000.
Lowry, James, to Westinghouse Electric Corp. Elevator system. 4,501,345, Cl. 187-29.00R.
Lowry, Louis D.: *See*—
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,502,150, Cl. 381-70.000.
Loza, Roman: *See*—
Greene, Janice L.; and Loza, Roman, 4,501,881, Cl. 528-336.000.
Lucas Industries Limited: *See*—
Goodwin, Alan; and Brearley, Malcolm, 4,502,006, Cl. 324-208.000.
Reynolds, Desmond H.; and Taft, Philip A., 4,501,451, Cl. 303-6.00A.
Sinclair, Walter, 4,502,152, Cl. 455-73.000.
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Jarrett, Boaz A.; Fenne, Ivor; Lakin, David F.; and Mowbray, Dorian F., 4,501,244, Cl. 123-446.000.
Luck, Clarence F., Jr., to Raytheon Company. Method of focusing optical apparatus. 4,501,962, Cl. 250-201.000.
Lukianoff, Sergei G. Hand-held sanding device. 4,501,096, Cl. 51-391.000.
Lund, David L., to GNB Batteries Inc. Apparatus and method for fusing battery terminals with improved induction heating power control. 4,501,943, Cl. 219-10.430.
Lundell, George F.: *See*—
Baldwin, John J.; Jones, James H.; and Lundell, George F., 4,501,900, Cl. 548-436.000.
Lundh, Bengt: *See*—
Hakansson, Sven; and Lundh, Bengt, 4,501,669, Cl. 210-770.000.
Lunn, William H. W.; and Vasileff, Robert T., to Eli Lilly and Company. Thieno and furopyridinium-substituted cephalosporins. 4,501,739, Cl. 514-203.000.
Luoma, Robert P., II: *See*—
Benin, Joshua; and Luoma. Robert P., II, 4,501,951, Cl. 219-243.000.
Lutz, Dieter; and Thieler, Wolfgang, to Sachs-Systemtechnik GmbH. Torsional oscillation damper with laterally displaceable damper member. 4,501,348, Cl. 192-106.100.
Lutz, Raymond S.: *See*—
Dobson, Diane P.; Farrell, Michael J.; and Lutz, Raymond S., 4,501,985, Cl. 310-270.000.
Lutz, Roman, to Siemens Aktiengesellschaft. Teleprinter. 4,501,930, Cl. 178-4.000.
Luwa Corporation: *See*—
McKelvey, James M., 4,501,498, Cl. 366-69.000.
Luxeder, William P. Process for producing ultra removable pressure sensitive labels. 4,501,772, Cl. 427-208.600.
Lymneos, Anthony C., to Millipore Corporation. Photometric apparatus and process. 4,501,969, Cl. 250-373.000.
Lyngstrup, Arne, to A/S Sparevirke. Safety mechanism for preventing the locking up of persons in cabinets. 4,501,203, Cl. 109-635.000.
Lyon, Floyd A., to Halm Instrument Co. Inc. Solar hot water system without heat exchanger. 4,501,262, Cl. 126-437.000.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Bauer, Friedrich; and Leonhard, Kurt, 4,501,239, Cl. 123-261.000.
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Wuhrl, Arno; and Kistner, Werner, 4,502,042, Cl. 340-568.000.
Maahs, Jerry D. Mammalian subject heating unit using radiant heat. 4,501,275, Cl. 128-402.000.
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Sakai, Kiyoshi; Ishikawa, Shozo; Arita, Tetsuo; Mabuchi, Minoru; and Umehara, Shoji, 4,501,808, Cl. 430-59.000.
MAC/GIL Ltd.: *See*—
Weatherly, Gilbert; and Slade, A. MacDonald, 4,501,782, Cl. 428-57.000.
MacDermott, Bruce R.; and Shapiro, Justin J. Adjustable micro-dispensing liquid pipet. 4,501,163, Cl. 73-864.130.
Mader, Gotz: *See*—
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Maeda, Yuji: *See*—
Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,737, Cl. 514-167.000.
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Johansson, Sune H.; and Gustavsson, John K. C., 4,501,198, Cl. 100-98.00R.
Magyar, Arpad M.; and Smith, Gerald G., to Pennzoil Company. Tire sealer and inflator. 4,501,825, Cl. 521-78.000.
Mahlmann, James P.; Schecter, Steven M.; and Scher, Lawrence, to General Foods Corporation. Controlled coffee roasting. 4,501,761, Cl. 426-467.000.
Maisch, Wolfgang: *See*—
Gassler, Hermann; Joos, Eugen; Kubach, Hans; Maisch, Wolfgang; and Singer, Erich, 4,501,247, Cl. 123-453.000.
Malani, Shrikant R.: *See*—
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Malaysian Rubber Producers' Research Association, The: *See*—
Campbell, David S.; Tinker, Andrew J.; and Mente, Peter G., 4,501,860, Cl. 525-359.400.
Maliga, Joachim H. Ultrasonic dental cleaning tip stabilizer. 4,501,558, Cl. 433-86.000.
Malkis, Valery A.: *See*—
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valery A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A., 4,501,320, Cl. 165-144.000.
Mallinckrodt, Inc.: *See*—
Periasamy, Muthunadar P., 4,501,920, Cl. 562-473.000.
Malloy, Thomas P.; and Swedo, Raymond J., to UOP Inc. Enhanced oil recovery. 4,501,675, Cl. 252-8.55D.
Maloblocki, Richard, to Ametc Development Company. Ball-type check valve. 4,501,292, Cl. 137-533.110.
Malone, Edgar W., to Reynolds Industries Inc. Low-inductance capacitor. 4,502,096, Cl. 361-308.000.
Manes, Kenneth L.; and Hart, William D., to Storage Technology Partners II. Printed circuit card air cooling system. 4,502,099, Cl. 361-383.000.
Mannesmann Aktiengesellschaft: *See*—
Haring, Manfred, 4,501,443, Cl. 285-328.000.
Landgraf, Helmut, 4,501,632, Cl. 156-187.000.
Manske, Heinz J., to Foringer, John W. B. Mounting system for optical sighting devices. 4,501,071, Cl. 33-245.000.
Marcellis, Alphonso W.; Johnson, Grannis S.; and Grinstein, Reuben H., to Diamond Shamrock Chemicals Company. Anionic polyhydroxy polyphenyl compounds as dispersants for aqueous slurries of carbonaceous materials. 4,501,594, Cl. 44-51.000.
Marchadour, Jean-Charles. Apparatus and method for cleaning flowable material filling devices. 4,501,622, Cl. 134-18.000.
Marchesano, Carlo, to Minnesota Mining and Manufacturing Company. Photographic color developer composition packaged in two or more concentrated parts, particularly solutions, and concentrated color developer water solution. 4,501,812, Cl. 430-466.000.
Marchetti, Joseph R.; and Thomas, Wilbur R., to Westinghouse Electric Corp. Flame retardant B-staged epoxy resin prepregs and laminates made therefrom. 4,501,787, Cl. 428-236.000.
Marcilly, Christian: *See*—
Dufresne, Pierre; Freund, Edouard; Marcilly, Christian; and Raatz, Francis, 4,501,656, Cl. 208-111.000.
Marco Wood Products, Inc.: *See*—
Markey, Dennis P.; and Rosen, George J., 4,501,103, Cl. 52-745.000.
Mark, Victor, to General Electric Company. Polycarbonate from carbonyl halide, bischloroformate and dihydric phenol. 4,501,875, Cl. 528-196.000.
Markey, Dennis P.; and Rosen, George J., to Marco Wood Products, Inc. Building construction and purlin hanger therefor with method of construction. 4,501,103, Cl. 52-745.000.
Marks, Gerald C.: *See*—
Blackwell, James B.; Marks, Gerald C.; and Vereecke, Paul, 4,501,794, Cl. 428-316.600.
Markusch, Peter H.; Rosthauser, James W.; and Beatty, Michael C., to Mobay Chemical Corporation. Stable, aqueous dispersions of polyurethane-ureas. 4,501,852, Cl. 524-591.000.

Maron, Leonard C., to Napco, Inc. Workpiece clamp assembly for electrolytic plating machine. 4,501,650, Cl. 204-198.000.

Marquest Medical Products, Inc.: *See*—
Williams, Charles D., 4,501,719, Cl. 422-102.000.

Marsoner, Hermann; Harnoncourt, Karl; and List, Helmut, to AVL AG. Device for charging an electrochemical measuring apparatus. 4,501,296, Cl. 137-625.410.

Martel, Jacques; Buendia, Jean; and Nezot, Francois, to Roussel Uclaf. Cyclopentanols. 4,501,687, Cl. 252-522.00R.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Aromatic sulfonyl alkanoates and alkylnitriles. 4,501,704, Cl. 260-465.00R.

Martel, Jacques: *See*—
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, 4,501,894, Cl. 548-186.000.

Martin, Edwin L. Hyper cleaning casing brush. 4,501,322, Cl. 166-173.000.

Martin, Laura A.: *See*—
Rohlfing, Raymond G.; and Martin, Laura A., 4,501,286, Cl. 137-15.000.

Martinez, Freddy: *See*—
Stefanescu Doru M.; and Martinez, Freddy, 4,501,612, Cl. 75-124.000.

Maruyama, Kazuo: *See*—
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Marven, Al: *See*—
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Marzocca, Francesco: *See*—
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Masaki, Hisaji: *See*—
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Masco Corporation: *See*—
Rasor, William; and Redman, Leon E., 4,501,386, Cl. 224-326.000.

Mashikian, Matthew S., to Energy Development Associates, Inc. Device for balancing parallel strings. 4,502,000, Cl. 320-6.000.

Mashimo, Tohru; Nishio, Takashi; and Satoh, Osamu, to Mazda Motor Corporation. Automatically controlled rock drilling apparatus. 4,501,199, Cl. 102-313.000.

Mason, Edward M.; Tanner, Murray Q., III; and Finley, Michael J., to Affiliated Hospital Products, Inc. Operating table. 4,501,414, Cl. 269-325.000.

Mason, Ronald C.: *See*—
DiNozzi, Robert D.; Vancelette, Stanley R.; Powell, Lionel E.; McLean, George F., Jr.; Sieger, Leon F.; and Mason, Ronald C., 4,501,064, Cl. 29-832.000.

Massachusetts Institute of Technology: *See*—
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Massey-Ferguson Services N.V.: *See*—
Muller, Jean Claude; and McNaught, James B., 4,501,282, Cl. 130-27.00P.

Masuda, Koji, to Nissan Motor Company, Limited. Catalyst for reforming of methanol and process of preparing same. 4,501,823, Cl. 502-304.000.

Mathewes, Wolfgang, to Kraftwerk Union Aktiengesellschaft. Sample-taking apparatus for a container, containing a bulk material feed. 4,501,162, Cl. 73-863.830.

Matier, William L.; and Kam, Sheung-Tsam, to American Hospital Supply Corporation. Method for treating glaucoma by the topical administration of selectively metabolized beta-blocking agents. 4,501,912, Cl. 560-66.000.

Matson, Gary R.: *See*—
Romansky, John A.; and Matson, Gary R., 4,501,483, Cl. 355-3.0FU.

Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, to Mita Industrial Company Limited. Heat-sensitive black recording material. 4,502,067, Cl. 346-214.000.

Matsuda, Yasuhiko, to Kabushiki Kaisha Sato. Temperature control system. 4,502,056, Cl. 346-76.0PH.

Matsufuji, Teruo, to Iwasaki Tsushinki Kabushiki Kaisha. Howler tone sending-out system in time-division electronic exchanges. 4,502,139, Cl. 370-110.200.

Matsui, Fumio; and Sashida, Mitsuaki, to Pioneer Electronic Corporation. System for developing a photo-resist material used as a recording medium. 4,501,480, Cl. 354-298.000.

Matsui, Kanenobu; Uchiumi, Shinichiro; Iwayama, Akira; and Umezu, Takashi, to Ube Industries, Ltd. Process for producing an acetal. 4,501,705, Cl. 260-465.600.

Matsui, Takahiro: *See*—
Tamura, Jun; Matsui, Takahiro; and Hozumi, Kazuo, 4,501,557, Cl. 433-79.000.

Matsumoto, Shuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Wear resistant sintered body. 4,501,613, Cl. 75-240.000.

Matsunaga, Toshio: *See*—
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, 4,501,223, Cl. 118-668.000.

Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, to Hitachi Zosen Corporation. Coating apparatus. 4,501,223, Cl. 118-668.000.

Matsushima, Haruo, to Matsushita Electric Industrial Co., Ltd. Turntable type high-frequency heating apparatus. 4,501,944, Cl. 219-10.55F.

Matsushima, Satoru: *See*—
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, 4,501,141, Cl. 73-146.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,501,686, Cl. 252-500.000.
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Morotomi, Noriaki; and Sato, Takeshi, 4,502,077, Cl. 358-167.000.
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Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, 4,502,081, Cl. 358-280.000.

Matsushita Graphic Communications Systems, Inc.: *See*—
Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, 4,502,081, Cl. 358-280.000.

Matsushita, Toshihiko: *See*—
Hiraishi, Shigetoshi; Morishita, Sadao; and Matsushita, Toshihiko, 4,501,809, Cl. 430-138.000.

Matsutani, Kanji, to Matsutani Seisakusho. Method for forming a hole of eyeless suture needle. 4,501,312, Cl. 163-5.000.

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Matsutani, Kanji, 4,501,312, Cl. 163-5.000.

Matsuzaka, Masayoshi: *See*—
Kubota, Hirotoshi; Takano, Akira; Arai, Isao; and Matsuzaka, Masayoshi, 4,501,397, Cl. 244-75.00R.

Mattes, Gerd, to Robert Bosch GmbH. Scene-start and -end reference indicator arrangement for projector storing scene-start and -end frame counts. 4,501,478, Cl. 352-5.000.

Maupin, Charles G.: *See*—
Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., 4,501,072, Cl. 34-1.000.

Maurice, Terrence J.; and Grealy, Jennifer M., to General Foods, Inc. Production of fat-containing protein fibers. 4,501,760, Cl. 426-250.000.

Mayer, Walter: *See*—
Schuller, Edmund; Mayer, Walter; Hini, Eugen; Bock, Erich; and Lovas, Kurt, 4,501,116, Cl. 57-263.000.

Mazda Motor Corporation: *See*—
Aizawa, Makoto; Kishimoto, Tsuneo; and Tanimoto, Yoshio, 4,501,790, Cl. 428-283.000.
Mashimo, Tohru; Nishio, Takashi; and Satoh, Osamu, 4,501,199, Cl. 102-313.000.

McCandless, James C., to International Harvester Co. Dynamic engine power assessment. 4,501,138, Cl. 73-116.000.

McCartney, Michael S.; and Pollock, William H., to Combustion Engineering, Inc. Overfire air admission with varying momentum air streams. 4,501,204, Cl. 110-264.000.

McCollum, Gregory J.: *See*—
Singer, Debra L.; McCollum, Gregory J.; and Dowbenko, Rostyslaw, 4,501,854, Cl. 525-162.000.

McCormick-Goodhart, Mark H., to Energy Conversion Devices, Inc. Microfiche recording apparatus and method with stationary film head. 4,501,487, Cl. 355-27.000.

McCoy, John J.: *See*—
Falcone, Samuel J.; and McCoy, John J., 4,501,915, Cl. 560-157.000.

McDaniel, John, to Biomet, Inc. Knee distraction device. 4,501,266, Cl. 128-69.000.

McDaniel, John M.; and Miller, Clayton R., to Zimmer, Inc. Metal and plastic composite tibial component for knee joint. 4,501,031, Cl. 3-1.911.

McGinnis, Gerald E. Endotracheal tube with pressure controlled inflatable cuff. 4,501,273, Cl. 128-207.150.

McGregor, Anderson D.: *See*—
Dyer, Lawrence D.; and McGregor, Anderson D., 4,501,258, Cl. 125-13.00R.

McGuire, Jeffrey C.: *See*—
Pandey, Ramesh C.; Toussaint, Margaret W.; McGuire, Jeffrey C.; and Thomas, Monica C., 4,501,699, Cl. 260-351.100.

McGuire, Michael L.; Seluga, David M.; and Blum, Michael R., to Weyerhaeuser Company. Method for reduction of formaldehyde emissions in wood composite panels. 4,501,628, Cl. 156-62.800.

McKee, Robert G. Clipboard. 4,501,438, Cl. 281-45.000.

McKelvey, James M., to Luwa Corporation. Method and apparatus for extruding thermoplastic material. 4,501,498, Cl. 366-69.000.

McKeough, David T.: *See*—
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,501,872, Cl. 528-18.000.

McLean, George F., Jr.: *See*—
DiNozzi, Robert D.; Vancelette, Stanley R.; Powell, Lionel E.; McLean, George F., Jr.; Sieger, Leon F.; and Mason, Ronald C., 4,501,064, Cl. 29-832.000.

McMinn, Derek J. W. Tendon repair. 4,501,029, Cl. 3-1.000.

McMinn, Robert R., to Harrison Equipment Co., Inc. Electric generator with replaceable motor. 4,501,962, Cl. 310-90.000.

McMurtrey, David K. Welded stem assembly. 4,501,435, Cl. 280-279.000.

McNab Incorporated: *See*—
Druker, Harvey A., 4,502,011, Cl. 324-446.000.

McNaught, James B.: *See*—
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McNeely, Ronald K., to RCA Corporation. Stylus arm insertion apparatus. 4,501,063, Cl. 29-711.000.
McQuain, David B.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,501,503, Cl. 374-162.000.
MDS Health Group Limited: *See*—
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Meca S.a.s. di Cagnoni Landoni S.C.: *See*—
Landoni, Giannino, 4,501,208, Cl. 112-118.000.
Medici, Italo: *See*—
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Mee, Gary L.; and Willcott, M. Robert. Method of measuring NMR spin-spin relaxation time (T_2) using spin-echos. 4,502,007, Cl. 324-307.000.
Mehes, Ferenc; and Mozes, Andras. Test machine for determining concrete strength. 4,501,153, Cl. 73-803.000.
Meier, Willi, to Dorina Nahmaschinen GmbH. Feed control for a sewing machine. 4,501,213, Cl. 112-316.000.
Meitzner, Erich F.; and Oline, James A., to Rohm and Haas Company. Anion exchange resin having a macroreticular structure. 4,501,826, Cl. 521-29.000.
Mengeringhausen Max. Method of manufacturing cantilevered composite structure. 4,501,052, Cl. 29-155.00R.
Menschner, Rolf; and Fischer, Robert, to Degussa Aktiengesellschaft. Metal effect glazes for ceramic bases. 4,501,778, Cl. 427-376.200.
Mente, Peter G.: *See*—
Campbell, David S.; Tinker, Andrew J.; and Mente, Peter G., 4,501,860, Cl. 525-359.400.
Merck & Co., Inc.: *See*—
Baldwin, John J.; Jones, James H.; and Lundell, George F., 4,501,900, Cl. 548-436.000.
Clineschmidt, Bradley V., 4,501,749, Cl. 514-326.000.
Merges, Veit; and Hummel, Kurt, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Mirror structure for reflecting and concentrating radiation energy. 4,501,469, Cl. 350-611.000.
Merk, Wolfgang; and Rink, Karl-Heinz, to Degussa Aktiengesellschaft. Process for the elimination of hydrogen sulfide or iron sulfide from an aqueous system. 4,501,668, Cl. 210-749.000.
Merk, Wolfgang: *See*—
Werle, Peter; and Merk, Wolfgang, 4,501,840, Cl. 524-387.000.
Merrill, Wayne S., to Millipore Corporation. Filter cartridges and methods and components for making them. 4,501,663, Cl. 210-347.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
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Metal Alloys, Inc.: *See*—
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Metal Box, P.L.C.: *See*—
Griffin, Christopher J.; and Oxborrow, Bernard H., 4,501,104, Cl. 53-48.000.
Meyer, Jeffry R., to Westinghouse Electric Corp. High current contact. 4,501,466, Cl. 339-255.00P.
Meyer, Theodor: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,501,839, Cl. 524-247.000.
Meyer, Urs P. Mast for a sail. 4,501,214, Cl. 114-39.000.
Michaels, Terry J., to Lescrenier, Charles. Means for visually indicating an X-ray field. 4,502,147, Cl. 378-206.000.
Michalak, Peter: *See*—
Lisner, Herbert; and Michalak, Peter, 4,502,005, Cl. 324-158.0MG.
Micro Technology Laboratory Co., Ltd.: *See*—
Mishima, Matsuo, 4,501,984, Cl. 310-261.000.
Middlekauff, Carle A., to W. H. Nichols Company. Compact high torque gerotor-type hydraulic motor. 4,501,536, Cl. 418-61.00B.
Miller, Clayton R.: *See*—
McDaniel, John M.; and Miller, Clayton R., 4,501,031, Cl. 3-1.911.
Miller, Ira; Null, Michael W.; and Dotson, Robert N., to Motorola, Inc. Pulse stretching and level shifting circuit. 4,501,974, Cl. 307-246.000.
Miller, Richard; and Riser, Janine M., to Research One Limited Partnership. Rapid set lightweight cement product. 4,501,830, Cl. 523-401.000.
Miller, Robert E.: *See*—
Foerster, Charles E., Jr.; Miller, Robert E.; and Pace, Aldren M., 4,501,972, Cl. 250-577.000.
Miller, Robert J.: *See*—
Drinkuth, William H.; Bires, Robert J.; Miller, Robert J.; and Selleck, Franklin G., 4,501,095, Cl. 51-165.720.
Miller, Stephen B.; Stewart, Ronald L.; and Thompson, David A., to Corning Glass Works. Process for making sintered glasses and ceramics. 4,501,602, Cl. 65-18.200.
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Grandin, Roland E.; and Milligan, Barton, 4,501,922, Cl. 564-408.000.
Millipore Corporation: *See*—
Lymneos, Anthony C., 4,501,969, Cl. 250-373.000.
Merrill, Wayne S., 4,501,663, Cl. 210-347.000.
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Minami, Kazuaki; Totani, Shinzo; Miura, Kunio; Akutsu, Kazushi; and Ohyama, Shinji, to Nippondenso Co., Ltd. Navigation system for use with an automobile and reading unit for the system. 4,502,123, Cl. 364-424.000.
Miner, Robert L., Jr.: *See*—
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Sievert, James A., 4,501,927, Cl. 174-93.000.
Tomsyck, John P.; and Zohn, Thomas J., 4,501,396, Cl. 242-199.000.
Minnick, Larry A.: *See*—
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Mirviss, Stanley B., to Stauffer Chemical Company. Chloromethylation process. 4,501,903, Cl. 549-29.000.
Mishima, Matsuo, to Micro Technology Laboratory Co., Ltd. Columnar solid body rotor. 4,501,984, Cl. 310-261.000.
Misumi, Teruo: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,501,807, Cl. 430-57.000.
Mita Industrial Company Limited: *See*—
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, 4,502,067, Cl. 346-214.000.
Tsudaka, Hideaki, 4,501,485, Cl. 355-6.000.
Mitchell, Curtis W.; and Berg, Howard M., to Motorola, Inc. LED having self-aligned lens. 4,501,637, Cl. 156-630.000.
Mitchell, Daniel M., to Rockwell International Corporation. Bootstrapped AC-DC power converter. 4,502,104, Cl. 363-26.000.
Mitchell, Michael J.: *See*—
Reeder, Frank; Nunn, Michael J.; Mitchell, Michael J.; and Baxter, Kenneth F., 4,501,615, Cl. 106-14.390.
Mitrofanov, Nicholas M.; and Berner, Victor G., to Harshaw/Filtrol Partnership. Ethylene quenched multi-cathode Geiger-Mueller tube with sleeve-and-screen cathode. 4,501,988, Cl. 313-93.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ebisaka, Toshinobu, 4,502,086, Cl. 361-87.000.
Furukawa, Teruo, 4,502,036, Cl. 340-347.0DD.
Ina, Teruo, 4,501,123, Cl. 62-119.000.
Ito, Haruhiko; and Sano, Mineo, 4,502,031, Cl. 335-277.000.
Kimura, Minoru; and Takahashi, Hisamitsu, 4,502,032, Cl. 336-58.000.
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Tatsumi, Takumi, 4,501,175, Cl. 74-869.000.
Usui, Masaji, 4,502,013, Cl. 328-26.000.
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Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Mitsubishi Paper Mills, Ltd.: *See*—
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Saikawa, Masahiko; Kanada, Eiji; Tanaka, Akira; and Endo, Kazunaka, 4,501,811, Cl. 430-204.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Nakanishi, Hikaru, 4,501,785, Cl. 428-195.000.
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, to Zenyaku Kogyo Kabushiki Kaisha. Extract from barrenwort. 4,501,736, Cl. 424-195.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Nagano, Riichiro; Kiga, Hiroshi; and Iwata, Tadao, 4,501,827, Cl. 523-214.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Nioh, Susumu; Hirayama, Hiroshi; Honda, Tetsuzo; and Ishida, Koji, 4,501,773, Cl. 427-213.000.
Mitsui Toatsu Kaguku Kabushiki Kaisha: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.
Mitsuyu, Tsuneo; Ono, Shusuke; Inaba, Ritsuo; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave transducer using a split-finger electrode on a multi-layered substrate. 4,501,987, Cl. 310-313.00A.
Miura, Kunio: *See*—
Minami, Kazuaki; Totani, Shinzo; Miura, Kunio; Akutsu, Kazushi; and Ohyama, Shinji, 4,502,123, Cl. 364-424.000.
Miyahara, Junji: *See*—
Arakawa, Satoshi; and Miyahara, Junji, 4,501,683, Cl. 252-301.260.
Miyakawa, Nobuhiro: *See*—
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, 4,502,067, Cl. 346-214.000.

Miyamoto, Koichi; and Tonomura, Yoshinobu, to Canon Kabushiki Kaisha. Copying apparatus. 4,501,490, Cl. 355-55.000.

Miyano, Toshiyuki: *See*—
Ariga, Yoshio; Miyano, Toshiyuki; and Wakisaka, Yukinori, 4,501,418, Cl. 271-187.000.

Miyata, Mitsuto: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,501,998, Cl. 318-568.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,502,108, Cl. 364-170.000.

Miyatake, Kimio: *See*—
Ebi, Hiroyuki; and Miyatake, Kimio, 4,501,968, Cl. 250-343.000.

Miyazaki, Hiroshi; and Kato, Masahisa, to Mitsubishi Denki Kabushiki Kaisha. Hole sewing machine. 4,501,207, Cl. 112-66.000.

Miyazaki, Mutsumi: *See*—
Yatsuda, Hisao; and Miyazaki, Mutsumi, 4,501,819, Cl. 501-61.000.

Miyazaki, Yusuke: *See*—
Yuguchi, Hiroya; Hayashi, Yoshinobu; and Miyazaki, Yusuke, 4,501,763, Cl. 426-573.000.

Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, to Ishihara Sangyo Kaisha, Ltd. Process for the production of cobalt-containing magnetic iron oxide powder. 4,501,774, Cl. 427-215.000.

Mizoguchi, Fumio, to Olympus Optical Co., Ltd. Apparatus for detecting an amount of liquid remained in a vessel. 4,502,126, Cl. 364-509.000.

Mizuhara, Hisayoshi; Omori, Shigenori; and Tanaka, Akira, to Yoshida Kogyo K. K. Apparatus for shaping coiled slide fastener coupling elements. 4,501,547, Cl. 425-391.000.

Mizukami, Osamu: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,501,634, Cl. 156-244.240.

Mobay Chemical Corporation: *See*—
Markusch, Peter H.; Rosthauser, James W.; and Beatty, Michael C., 4,501,852, Cl. 524-591.000.

Mobil Oil Corporation: *See*—
LaPierre, Rene B.; Partridge, Randell D.; Chen, Nai Y.; and Wong, Steven S., 4,501,926, Cl. 585-739.000.
Le, Quang N.; and Neuman, Daniel J., 4,501,652, Cl. 208-57.000.
Nichols, Dean P., 4,501,328, Cl. 166-288.000.
Prior, Maurice; and Quigley, M. Scott, 4,501,143, Cl. 73-153.000.

Modzinski, Charles J.; and Devaney, Michael J., to United States of America, Army. Vehicle interior deicing/defogging system. 4,501,390, Cl. 237-12.30C.

Moggi, Giovanni, to Montedison S.p.A. Accelerators for vulcanizing vinylidene fluoride elastomeric copolymers. 4,501,858, Cl. 525-340.000.

Mohan, Raam R.: *See*—
Allan, David E.; Molstedt, Byron V.; and Mohan, Raam R., 4,501,820, Cl. 502-27.000.

Mol, Pieter K. Connecting device between two wheel rims. 4,501,450, Cl. 301-13.0SM.

Molla, Aberra. Method of determining immunoglobulin levels in mammals. 4,501,816, Cl. 436-34.000.

Molstedt, Byron V.: *See*—
Allan, David E.; Molstedt, Byron V.; and Mohan, Raam R., 4,501,820, Cl. 502-27.000.

Moltner, Hermann: *See*—
Staat, Karl-Hans; and Moltner, Hermann, 4,501,134, Cl. 72-8.000.

Moniot, Jerome L.: *See*—
Thottathil, John K.; Moniot, Jerome L.; Floyd, David; and Brandt, Steven, 4,501,901, Cl. 548-532.000.

Monsanto Company: *See*—
Higginbottom, Harold P., 4,501,864, Cl. 525-484.000.
Kwentus, Gerald K.; and Suda, Michael, 4,501,907, Cl. 549-259.000.
Papanu, Victor D., 4,501,847, Cl. 524-502.000.
Plischke, LeMoyne W., 4,501,882, Cl. 528-336.000.
Ucci, Pompelio A.; and Blyth, Randolph C., 4,501,591, Cl. 8-495.000.
Woodbrey, James C., 4,501,861, Cl. 525-421.000.

Monsees, Claude E., to Rexham Corporation. Packaging machine with improved web feeding system. 4,501,109, Cl. 53-451.000.

Montedison S.p.A.: *See*—
Di Toro, Vincenzo; Gozzo, Franco; and Boschi, Pier M., 4,501,916, Cl. 560-180.000.
Moggi, Giovanni, 4,501,858, Cl. 525-340.000.

Monterey Manufacturing Co.: *See*—
Hall, Charles P.; and Philipson, Joseph, 4,501,035, Cl. 5-451.000.

Mookherjee, Braja D.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.

Moore, Leonard: *See*—
Furlong, Owen D.; Moore, Leonard; and Ward, Jonathan D., 4,501,293, Cl. 137-557.000.

Moore, M. Samuel, to Semco Instruments, Inc. Engine temperature transient compensating circuit. 4,502,043, Cl. 340-588.000.

Moorhouse, Peter, to International Research & Development Company. Polytetrafluoroethylene solid lubricant materials. 4,501,676, Cl. 252-12.000.

Moos, Walter: *See*—
Trivedi, Bharat; Hamilton, Harriet; and Moos, Walter, 4,501,735, Cl. 514-46.000.

Morgan, Thomas A., to Honeywell Information Systems Inc. Hand tool for installing compression rings on radial positioning devices. 4,501,054, Cl. 29-235.000.

Mori, Kei. Fishing net. 4,501,084, Cl. 43-17.500.

Mori, Sanae, to Daido Metal Company Ltd. Method for measuring an adhesive strength of a multi-layer material. 4,501,134, Cl. 73-827.000.

Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Transfer type heat-sensitive recording medium. 4,502,065, Cl. 346-204.000.

Morinaga Milk Industry Co., Ltd.: *See*—
Yuguchi, Hiroya; Hayashi, Yoshinobu; and Miyazaki, Yusuke, 4,501,763, Cl. 426-573.000.

Morishita, Sadao: *See*—
Hiraishi, Shigetoshi; Morishita, Sadao; and Matsushita, Toshihiko, 4,501,809, Cl. 430-138.000.

Morishita, Yasuji: *See*—
Fujiwara, Kaisaku; Yokooji, Shigenori; and Morishita, Yasuji, 4,502,047, Cl. 340-693.000.

Morita, Hideo: *See*—
Kishimoto, Yasushi; and Morita, Hideo, 4,501,857, Cl. 525-338.000.

Morotomi, Noriaki; and Sato, Takeshi, to Matsushita Electric Industrial Co., Ltd. Ghost canceling apparatus. 4,502,077, Cl. 358-167.000.

Morrell, Roger J.; and Larson, David A., to United States of America, Interior. Universal ripper miner. 4,501,448, Cl. 299-67.000.

Morris, Charles A., to Henkel Corporation. Honey coated nuts. 4,501,758, Cl. 426-93.000.

Morrison, Heber J.; and Koenig, Lawrence W., to Westinghouse Electric Corp. Power amplifier with controllable lossless snubber circuit. 4,502,085, Cl. 361-56.000.

Morse, David L.: *See*—
Borrelli, Nicholas F.; Keck, Donald B.; Morse, David L.; and Sachenik, Paul A., 4,501,468, Cl. 350-96.250.

Morse, Milton, to APM Corporation. Protective cover for telephone. 4,501,936, Cl. 179-184.000.

Morton, Edward W.: *See*—
Evans, George S.; Morton, Edward W.; Gilmore, John F., deceased; and Gilmore, Roderick A., Administrator, 4,501,992, Cl. 315-122.000.

Mosbach, Klaus: *See*—
Schroder, Ulf; and Mosbach, Klaus, 4,501,726, Cl. 424-1.100.

Moser, Theo; and Mader, Gotz, to Robert Bosch GmbH. Machine for filling and closing two-piece hard gelatine capsules. 4,501,307, Cl. 141-258.000.

Moshinsky, Igor B. Dispersion of reflected radar. 4,501,784, Cl. 428-156.000.

Mostek Corporation: *See*—
Proebsting, Robert J., 4,502,140, Cl. 371-28.000.

Mostyn, William T., Jr., to Telco Systems, Inc. Solid state electronic dial pulse receiver circuit. 4,501,932, Cl. 179-16.0AA.

Motherwell, William B.: *See*—
Barton, Derek H. R.; Motherwell, William B.; and Zard, Sammir Z., 4,501,701, Cl. 260-397.400.

Motornetics Corporation: *See*—
Welburn, Ross D., 4,501,980, Cl. 310-12.000.

Motorola, Inc.: *See*—
Jouvet, Adrien; and Duvois, Eric, 4,501,960, Cl. 235-492.000.
Miller, Ira; Null, Michael W.; and Dotson, Robert N., 4,501,974, Cl. 307-246.000.
Mitchell, Curtis W.; and Berg, Howard M., 4,501,637, Cl. 156-630.000.
Null, Michael W.; Dotson, Robert N.; and Davis, Robert B., 4,501,979, Cl. 307-494.000.

Motter Printing Press Co.: *See*—
Loebach, Michael H., 4,501,415, Cl. 270-60.000.

Mowbray, Dorian F.: *See*—
Jarrett, Boaz A.; Fenne, Ivor; Lakin, David F.; and Mowbray, Dorian F., 4,501,244, Cl. 123-446.000.

Mozes, Andras: *See*—
Mehes, Ferenc; and Mozes, Andras, 4,501,153, Cl. 73-803.000.

Mrotzek, Herbert: *See*—
Paersch, Michael; Mrotzek, Herbert; Haukelt, Helmut; and Schreckenberg, Heinz-Wilhelm, 4,501,593, Cl. 44-23.000.

MTS Systems Corporation: *See*—
Petersen, Paul S., 4,501,139, Cl. 73-118.000.

Mueller, Peter; Ury, Michael G.; and Wood, Charles H., to Fusion Systems Corporation. Deep UV lamp bulb. 4,501,993, Cl. 315-248.000.

Mueller, Richard A.; and Partis, Richard A., to G.D. Searle & Co. [Halo-4-(4,5-dihydro-4,4-dimethyl-2-oxazolyl)-phenyl]octadecan-ols and -ones. 4,501,895, Cl. 548-239.000.

Muller, Alfred; Schaller, Dieter; and Schwab, Manfred, to Robert Bosch GmbH. Method of controlling downshift after braking in automatic transmissions of motor vehicles. 4,501,170, Cl. 74-866.000.

Muller, Alfred; and Schwab, Manfred, to Robert Bosch GmbH. Control of the shift points of an automatic transmission for temporary acceleration increase. 4,501,171, Cl. 74-866.000.

Muller, George H., to Ford Motor Company. Tuned engine intake manifold. 4,501,235, Cl. 123-52.00M.

Muller, Gernot: *See*—
Karr, Gerald W.; and Muller, Gernot, 4,501,197, Cl. 100-35.000.

Muller, Jean Claude; and McNaught, James B., to Massey-Ferguson Services N.V. Combine harvester crop in-feed conveyor. 4,501,282, Cl. 130-27.00P.

Muller, John E.; and Muller, John E., Jr., to Pomona Service & Supply Co., Inc. Fruit-depositing mechanism. 4,501,350, Cl. 198-478.000.

Muller, John E., Jr.: *See*—
Muller, John E.; and Muller, John E., Jr., 4,501,350, Cl. 198-478.000.

Muller, Reiner: *See—*
Weiler, Rolf; and Muller, Reiner, 4,501,410, Cl. 251-366.000.
Muller, Rolf, to Papst-Motoren GmbH & Co KG. Magnetization for brushless direct current outer rotor motor. 4,501,997, Cl. 318-254.000.
Munier, Daniel: *See—*
Stahl, Andre ; Munier, Daniel; and Bertrand, Andre , 4,502,022, Cl. 331-68.000.
Murakami, Shusaku: *See—*
Tsutsui, Osamu; Murakami, Shusaku; Kuwahara, Hidehiko; and Yasunaga, Shigefumi, 4,501,261, Cl. 126-351.000.
Muralidhara, Ranya: *See—*
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Murokawa, Masayuki: *See—*
Yoshida, Kei; Murokawa, Masayuki; and Nomura, Toshiaki, 4,501,090, Cl. 49-264.000.
Murphy, John B., to Hewlett-Packard Company. Continuous catheter flushing apparatus. 4,501,300, Cl. 138-46.000.
Murphy, John W., to Ammco Tools, Inc. Slip plates for lift rack. 4,501,342, Cl. 187-8.410.
Murray, Myles N., to Industrial Electronic Rubber Company. Solenoid actuated fluid control valve. 4,501,407, Cl. 251-141.000.
Muto, Kenji; Karasawa, Akira; Kuroda, Tokuyuki; and Nakamizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. 1,4-Dihydropyridine derivatives. 4,501,748, Cl. 514-318.000.
Muto, Norishige: *See—*
Yoan, Toyohiko; and Muto, Norishige, 4,501,524, Cl. 414-22.000.
Nagahiro, Kenichi: *See—*
Toki, Susumu; and Nagahiro, Kenichi, 4,501,234, Cl. 123-41.860.
Nagamine, Tsuyoshi: *See—*
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,501,998, Cl. 318-568.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,502,108, Cl. 364-170.000.
Nagamune, Teruyuki: *See—*
Endo, Isao; Nagamune, Teruyuki; and Inoue, Ichiro, 4,501,161, Cl. 73-863.240.
Nagano, Riichiro; Kiga, Hiroshi; and Iwata, Tadao, to Mitsui Petrochemical Industries, Ltd. Glass-reinforced polymer composition comprising 4-methyl-1-pentene polymer in combination with a graft modified acid polymer of 4-methyl-1-pentene polymer. 4,501,827, Cl. 523-214.000.
Naganuma, Seihachi: *See—*
Suzuki, Katsuhiko; and Naganuma, Seihachi, 4,501,115, Cl. 57-220.000.
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Apparatus for making a magnetic recording medium. 4,501,225, Cl. 118-718.000.
Nagaoka, Muneo, to I & K Trading Company. Shuttle wheel toy. 4,501,568, Cl. 446-450.000.
Nagel, Colin M.: *See—*
Heath, Robert B.; and Nagel, Colin M., 4,501,032, Cl. 5-94.000.
Nagumo, Masahide: *See—*
Nishikawa, Meisei; Nagumo, Masahide; and Kojima, Tadashi, 4,502,024, Cl. 332-9.00R.
Nahara, Akira: *See—*
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, 4,501,225, Cl. 118-718.000.
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Kanesaki, Nobukazu, to Nissan Motor Company, Limited. Fuel injection rate deducing system for a diesel engine. 4,501,140, Cl. 73-119.00A.
Nakajima, Koichi: *See—*
Ueno, Haruo; Ashitaka, Hidetomo; and Nakajima, Koichi, 4,501,867, Cl. 526-136.000.
Nakajima, Masao: *See—*
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Kanesaki, Nobukazu, 4,501,140, Cl. 73-119.00A.
Nakamizo, Nobuhiro: *See—*
Muto, Kenji; Karasawa, Akira; Kuroda, Tokuyuki; and Nakamizo, Nobuhiro, 4,501,748, Cl. 514-318.000.
Nakamura, Masayuki; Tsuriya, Masaaki; and Funabashi, Masahiko, to Sumitomo Durez Company, Ltd. Liquid refractory binder. 4,501,836, Cl. 524-66.000.
Nakamura, Yukihiro: *See—*
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,501,606, Cl. 71-92.000.
Nakanishi, Hikaru, to Mitsubishi Rayon Co., Ltd.; and Senko Medical Instrument Mfg., Co., Ltd. Hydrophilized membrane of porous hydrophobic material and process of producing same. 4,501,785, Cl. 428-195.000.
Nakano, Eiichi: *See—*
Furuno, Nobuo; Ota, Yoshio; Itai, Masahiro; Tokuyama, Akio; and Nakano, Eiichi, 4,501,649, Cl. 204-181.00R.
Nakano, Shinji: *See—*
Oda, Shoji; Ehara, Kunihiko; Umemoto, Hirotoshi; and Nakano, Shinji, 4,501,829, Cl. 523-400.000.
Umemoto, Hirotoshi; Tanabe, Hisaki; Yamada, Mitsuo; and Nakano, Shinji, 4,501,863, Cl. 525-443.000.
Nakano, Takuo: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.
Nakashima, Toshiaki: *See—*
Yokoi, Koichi; Tachibana, Koichi; Isomae, Kazuo; and Nakashima, Toshiaki, 4,501,752, Cl. 514-414.000.
Nakata, Kazuo: *See—*
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.
Nakazato, Katsuo: *See—*
Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, 4,502,081, Cl. 358-280.000.
Nanba, Yuzaburo, to Eisai Co., Ltd. Cell for measurement. 4,501,497, Cl. 356-246.000.
Napco, Inc.: *See—*
Maron, Leonard C., 4,501,650, Cl. 204-198.000.
National Distillers and Chemical Corporation: *See—*
Braus, Harry, 4,501,688, Cl. 252-573.000.
Nauchno-Issledovatelsky I Experimentalny Institut Avtomovilnogo Elektrooborudovania I Avtopriborov: *See—*
Bukhteev, Pavel I.; Posleider, Grigory Y.; Kartavtsev, Viktor M.; and Bytsak, Vladimir S., 4,501,059, Cl. 29-564.500.
Nausedas, Joseph A., to Union Carbide Corporation. Internal tube support for co-extrusion stuffing tube assembly. 4,501,542, Cl. 425-133.100.
NCR Corporation: *See—*
Hain, David A., 4,501,416, Cl. 271-3.100.
Weeks, David E.; Reece, John W.; and Wirth, Robert L., 4,501,506, Cl. 400-124.000.
Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See—*
Bulten, Eric J.; and Liebregts, Antonius M. J., 4,501,702, Cl. 260-429.00R.
Needham, Donald G., to Phillips Petroleum Company. Composition of polymer of olefin with mixed mineral filler. 4,501,843, Cl. 524-445.000.
Nelson, Alfred W., to Textron Inc. Quick disconnect assembly. 4,501,404, Cl. 248-503.100.
Nelson, David A.; and Saller, Kenneth R., to Comlinear Corporation. Settling time reduction in wide-band direct-coupled transistor amplifiers. 4,502,020, Cl. 330-265.000.
Nelson, Keith E., to Dynatech Laboratories Incorporated. Fluorometer. 4,501,970, Cl. 250-458.100.
Neuman, Daniel J.: *See—*
Le, Quang N.; and Neuman, Daniel J., 4,501,652, Cl. 208-57.000.
Newall Engineering Company Limited, The: *See—*
Fisher, Allan J., 4,501,093, Cl. 51-165.710.
Newman, Neil F.; and Kowalski, Ronald C., to Exxon Research & Engineering Co. Process for the manufacture of halogenated polymers. 4,501,859, Cl. 525-356.000.
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, to Roussel Uclaf. Heterocyclic alcohols and their derivatives. 4,501,894, Cl. 548-186.000.
Nezot, Francois: *See—*
Martel, Jacques; Buendia, Jean; and Nezot, Francois, 4,501,687, Cl. 252-522.00R.
Ng, Kwokei J.: *See—*
Andresen, Brian D.; and Ng, Kwokei J., 4,501,817, Cl. 436-161.000.
Nibbe, Bodo B.; and Hirsch, Paul. Device for cooking foods with microwaves. 4,501,946, Cl. 219-10.55E.
Nicholas, James A.; and Krukowski, Richard. Manual muscle tester. 4,501,148, Cl. 73-379.000.
Nicholas, John F.; and Salvagni, Edward A., to General Electric Company. Diode detector with linearity compensating circuit. 4,502,015, Cl. 329-166.000.
Nichols, Cynthia L.; and Kornfeld, Edmund C., to Eli Lilly and Company. Trans-(±)-2,4,6-substituted-5,5a,6,7,8,9,9a,10-octahydropyrimido[4,5-g]quinolines. 4,501,890, Cl. 514-267.000.
Nichols, Dean P., to Mobil Oil Corporation. Method of consolidation of oil bearing sands. 4,501,328, Cl. 166-288.000.
Nicholson, Margie M., to Rockwell International Corporation. Tunable electrochromic filter. 4,501,472, Cl. 350-357.000.
Niimi, Yukihide; Yoshida, Seietsu; and Ohnaka, Hidemi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control apparatus. 4,501,242, Cl. 123-440.000.
Niimi, Yukihide; Kinoshita, Kenzi; and Urushidani, Masahiro, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control apparatus. 4,501,243, Cl. 123-440.000.
Niitsuma, Hiroaki: *See—*
Konno, Junichi; Ueda, Yukihiro; Niitsuma, Hiroaki; and Chubachi, Noriyoshi, 4,501,149, Cl. 73-587.000.
Nikkuni, Hiroharu, to Tsutsumi, Shigeru. Cap means for preventing resin from remaining in a mold of a runnerless injection molding apparatus. 4,501,550, Cl. 425-549.000.
Nilssen, Ole K. Full-bridge electronic inverter circuit. 4,502,107, Cl. 363-133.000.
Nimerick, Kenneth H.: *See—*
Parks, Christ F.; and Nimerick, Kenneth H., 4,501,775, Cl. 427-220.000.
Nioh, Susumu; Hirayama, Hiroshi; Honda, Tetsuzo; and Ishida, Koji, to Toyo Engineering Corporation; and Mitsui Toatsu Chemicals, Inc. Granulation process. 4,501,773, Cl. 427-213.000.
Nippon Cable System, Inc.: *See—*
Teraura, Makoto; and Baba, Masanao, 4,501,218, Cl. 114-144.00R.
Nippon Electric Co., Ltd.: *See—*
Kuki, Takakuni, 4,502,141, Cl. 371-37.000.
Saito, Masato, 4,502,110, Cl. 364-200.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ikuma, Masahiro, 4,501,186, Cl. 84-1.160.

Nippon Mining Co., Ltd.: *See*—
Ogata, Takashi; Hosaka, Hiroshi; and Kasai, Shunichi, 4,501,666, Cl. 210-688.000.
Nippon Paint Co., Ltd.: *See*—
Furuno, Nobuo; Ota, Yoshio; Itai, Masahiro; Tokuyama, Akio; and Nakano, Eiichi, 4,501,649, Cl. 204-181.00R.
Iimure, Tamio, 4,501,767, Cl. 427-44.000.
Oda, Shoji; Ehara, Kunihiko; Umemoto, Hirotoshi; and Nakano, Shinji, 4,501,829, Cl. 523-400.000.
Umemoto, Hirotoshi; Tanabe, Hisaki; Yamada, Mitsuo; and Nakano, Shinji, 4,501,863, Cl. 525-443.000.
Nippon Soken, Inc.: *See*—
Kuno, Akira; and Shinoda, Yoshio, 4,501,284, Cl. 123-352.000.
Nippon Steel Corporation: *See*—
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, 4,501,802, Cl. 428-629.000.
Nippon Steel Metal Products Co., Ltd.: *See*—
Saito, Ken; Ochi, Tsuneo; Furunishi, Kaoru; and Yuki, Takeshi, 4,501,402, Cl. 248-346.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kato, Masami; and Yoshikai, Noriaki, 4,502,143, Cl. 371-57.000.
Nippondenso Co., Ltd.: *See*—
Minami, Kazuaki; Totani, Shinzo; Miura, Kunio; Akutsu, Kazushi; and Ohyama, Shinji, 4,502,123, Cl. 364-424.000.
Niimi, Yukihide; Yoshida, Seietsu; and Ohnaka, Hidemi, 4,501,242, Cl. 123-440.000.
Niimi, Yukihide; Kinoshita, Kenzi; and Urushidani, Masahiro, 4,501,243, Cl. 123-440.000.
Omori, Norio; Tabe, Tsutomu; Ito, Katsunori; and Hayashi, Shukichi, 4,501,250, Cl. 123-486.000.
Nisato, Dino; Boveri, Sergio; Roncucci, Romeo; and Carminati, Paolo, to Sanofi. Certain amide derivatives of 2-guanidino-thiazoles and compositions containing same. 4,501,747, Cl. 514-342.000.
Nishikawa, Akira; Saito, Toru; and Otsuka, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Power switch apparatus. 4,502,132, Cl. 361-332.000.
Nishikawa, Isamu: *See*—
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, 4,501,223, Cl. 118-668.000.
Nishikawa, Meisei; Nagumo, Masahide; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse-width modulation circuit. 4,502,024, Cl. 332-9.00R.
Nishinaka, Hiroki: *See*—
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishinaka, Hiroki, 4,501,223, Cl. 118-668.000.
Nishio, Takashi: *See*—
Mashimo, Tohru; Nishio, Takashi; and Satoh, Osamu, 4,501,199, Cl. 102-313.000.
Nissan Motor Company, Limited: *See*—
Aono, Shigeo, 4,501,240, Cl. 123-339.000.
Ishida, Takashi, 4,501,436, Cl. 280-666.000.
Masuda, Koji, 4,501,823, Cl. 502-304.000.
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Kanesaki, Nobukazu, 4,501,140, Cl. 73-119.00A.
Sugano, Kazuhiko, 4,501,174, Cl. 74-869.000.
Yamamoto, Tadahiro; and Oota, Tadaki, 4,501,709, Cl. 261-44.00D.
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,502,122, Cl. 364-424.000.
Nitta, Yoshihiko: *See*—
Okajima, Atsushi; Nitta, Yoshihiko; and Yamano, Fumiyuki, 4,502,128, Cl. 364-900.000.
Niwa, Takashi, to Matsushita Electric Industrial Co., Ltd. Control circuit for a humidity sensor. 4,501,147, Cl. 73-336.500.
NL Industries, Inc.: *See*—
Bates, Howard J., Jr., 4,501,219, Cl. 114-264.000.
Noguchi, Tadashi: *See*—
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, 4,502,148, Cl. 381-7.000.
Nollkamper, Milton H., to Phillips Petroleum Company. Preheating of distillation feed. 4,501,657, Cl. 208-350.000.
Nolte, Albert; and Wallenfang, Gerd, to Klockner-Humboldt-Deutz AG. Governor for a diesel engine. 4,501,241, Cl. 123-367.000.
Nomori, Hiroyuki: *See*—
Abe, Naoto; Akimoto, Hidetoshi; and Nomori, Hiroyuki, 4,501,621, Cl. 134-17.000.
Nomura, Toshiaki: *See*—
Yoshida, Kei; Murokawa, Masayuki; and Nomura, Toshiaki, 4,501,090, Cl. 49-264.000.
Nomura, Yukio: *See*—
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, 4,501,802, Cl. 428-629.000.
Nordiskafilt AB: *See*—
Osterberg, Lars B., 4,501,303, Cl. 139-425.00A.
Noren, Gerry K., to DeSoto, Inc. Comb cationic polymers and aqueous dispersions thereof. 4,501,855, Cl. 525-218.000.
Normalair-Garrett (Holdings) Limited: *See*—
Furlong, Owen D.; Moore, Leonard; and Ward, Jonathan D., 4,501,293, Cl. 137-557.000.
Normier, Gerard: *See*—
Dussourd d'Hinterland, Lucien; Normier, Gerard; and Pinel, Anne-Marie, 4,501,693, Cl. 260-112.00R.
Norris Industries Inc.: *See*—
Grace, William R., 4,501,260, Cl. 126-299.00R.
North American Philips Corporation: *See*—
Shaulov, Avner, 4,501,967, Cl. 250-338.000.
North American Philips Lighting Corp.: *See*—
Evans, George S.; Morton, Edward W.; Gilmore, John F., deceased; and Gilmore, Roderick A., Administrator, 4,501,992, Cl. 315-122.000.
Norton Company: *See*—
Rossi, Giulio A., 4,501,818, Cl. 501-1.000.
Norton, John P., to Engineered Air Systems, Inc. Method and apparatus for liquid freezing. 4,501,126, Cl. 62-185.000.
Nottingham County Council: *See*—
Dury, Peter L. K., 4,501,420, Cl. 272-3.000.
Novotny, Larry G.: *See*—
Chandler, Curtis S.; Novotny, Larry G.; and Watts, Elvert S., 4,501,459, Cl. 339-48.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, to Fujitsu Fanuc Limited. Numerical controller equipped with optional block skip function. 4,501,998, Cl. 318-568.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, to Fujitsu Fanuc Limited. Position error correction equipment. 4,502,108, Cl. 364-170.000.
Nuclear Metals, Inc.: *See*—
Walz, Mark J., 4,501,073, Cl. 34-9.000.
NuJack Oil Pump Company: *See*—
Stanton, George E., 4,501,119, Cl. 60-398.000.
Null, Michael W.; Dotson, Robert N.; and Davis, Robert B., to Motorola, Inc. Current amplifier having multiple selectable outputs. 4,501,979, Cl. 307-494.000.
Null, Michael W.: *See*—
Miller, Ira; Null, Michael W.; and Dotson, Robert N., 4,501,974, Cl. 307-246.000.
Numata, Tatsuo: *See*—
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, 4,502,148, Cl. 381-7.000.
Nunn, Michael J.: *See*—
Reeder, Frank; Nunn, Michael J.; Mitchell, Michael J.; and Baxter, Kenneth F., 4,501,615, Cl. 106-14.390.
Oakland Corporation, The: *See*—
Wallace, Richard B., 4,501,041, Cl. 10-86.00A.
Obenauf, James E.; and Brodish, Charles E. Golfer's head motion sensor. 4,502,035, Cl. 340-323.00B.
O'Brien, John P., to Du Pont de Nemours, E. I., and Company. Cellulosic fibers from anisotropic solutions. 4,501,886, Cl. 536-57.000.
Ochi, Tsuneo: *See*—
Saito, Ken; Ochi, Tsuneo; Furunishi, Kaoru; and Yuki, Takeshi, 4,501,402, Cl. 248-346.000.
Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Radiographic intensifying screen. 4,501,971, Cl. 250-483.100.
Oda, Goro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of cleaning a photo-sensitive body. 4,501,620, Cl. 134-6.000.
Oda, Shoji; Ehara, Kunihiko; Umemoto, Hirotoshi; and Nakano, Shinji, to Nippon Paint Co., Ltd. Coating composition. 4,501,829, Cl. 523-400.000.
Odaira, Keikichi, to Yojigen Agricultural Corporation. Method of preparing artificial fertile soil. 4,501,604, Cl. 71-15.000.
Odum, Charles E. Engine air intake shut-off valve. 4,501,238, Cl. 123-198.00D.
Ogasawara, Makoto: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Hirai, Masaharu; Ogasawara, Makoto; and Kawamura, Toshihiko, 4,501,774, Cl. 427-215.000.
Ogata, Takashi; Hosaka, Hiroshi; and Kasai, Shunichi, to Nippon Mining Co., Ltd. Process for the removal of bismuth and antimony from aqueous sulfuric acid solution containing bismuth and/or antimony. 4,501,666, Cl. 210-688.000.
Ogawa, Kyosuke: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,501,807, Cl. 430-57.000.
Ogilvie, Kelvin K., to ens BIO LOGICALS Inc. Substituted-aza-cytosine compounds and anti-viral uses thereof. 4,501,744, Cl. 514-245.000.
O'Hara, Mark J.: *See*—
Hilfman, Lee; and O'Hara, Mark J., 4,501,655, Cl. 208-110.000.
O'Hare, Louis R. Convection powered solar food dryer. 4,501,074, Cl. 34-93.000.
Ohio State University, The: *See*—
Andresen, Brian D.; and Ng, Kwokei J., 4,501,817, Cl. 436-161.000.
Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,502,065, Cl. 346-204.000.
Ohnaka, Hidemi: *See*—
Niimi, Yukihide; Yoshida, Seietsu; and Ohnaka, Hidemi, 4,501,242, Cl. 123-440.000.
Ohnishi, Souichi; and Shiono, Fusahiro, to Sharp Kabushiki Kaisha. System for data transmission between electronic cash registers. 4,502,120, Cl. 364-405.000.
Ohtomo, Akinori: *See*—
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, 4,501,626, Cl. 148-36.000.
Ohuchi, Muneki, to JEOL Ltd. Method and apparatus for nuclear magnetic resonance spectroscopy. 4,502,008, Cl. 324-311.000.
Ohya, Nobumasa; Imai, Ryusaku; and Sato, Hitoshi, to Fujitsu Limited. Color information input system for electronic blackboard. 4,501,931, Cl. 178-18.000.

Ohyama, Shinji: *See*—
Minami, Kazuaki; Totani, Shinzo; Miura, Kunio; Akutsu, Kazushi; and Ohyama, Shinji, 4,502,123, Cl. 364-424.000.

Oka, Masahiko: *See*—
Tatemoto, Masayoshi; Oka, Masahiko; Kano, Hideo; Tomoda, Masayasu; and Ueta, Yutaka, 4,501,869, Cl. 526-249.000.

Okada, Kazuo: *See*—
Kondo, Mitsushige; Okada, Kazuo; and Hirasawa, Kazuo, 4,502,134, Cl. 369-46.000.

Okajima, Atsushi; Nitta, Yoshihiko; and Yamano, Fumiyuki, to Hitachi, Ltd. Translation between natural languages. 4,502,128, Cl. 364-900.000.

Okazaki, Yutaka: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.

Okerblom, Jury I.: *See*—
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valery A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A., 4,501,320, Cl. 165-144.000.

Okubo, Yukio: *See*—
Shigematsu, Kaisaburo; Shigematsu, Nobuo; and Okubo, Yukio, 4,501,272, Cl. 128-206.150.

Okumoto, Ryoji: *See*—
Kuniyoshi, Toru; and Okumoto, Ryoji, 4,501,432, Cl. 277-168.000.

Olin Corporation: *See*—
Sokolowski, Robert S., 4,501,317, Cl. 164-472.000.

Oline, James A.: *See*—
Meitzner, Erich F.; and Oline, James A., 4,501,826, Cl. 521-29.000.

Olmstead, Harold W.; Andrews, Gary D.; and Walquist, Clayton C., to Tektronix, Inc. Automatic "S" correction circuit. 4,501,995, Cl. 315-371.000.

Olson, Glenn O.: *See*—
Bannink, Engbert T., Jr.; and Olson, Glenn O., 4,502,092, Cl. 361-218.000.

Olsson, Mark S. Quick release weight belt and buckle therefor. 4,501,027, Cl. 2-321.000.

Olympus Optical Co., Ltd.: *See*—
Kimura, Tadashi, 4,501,474, Cl. 350-414.000.
Mizoguchi, Fumio, 4,502,126, Cl. 364-509.000.

Omark Industries, Inc.: *See*—
Scott, Lewis A.; and Gibson, Duane M., 4,501,184, Cl. 83-834.000.

Omori, Norio; Tabe, Tsutomu; Ito, Katsunori; and Hayashi, Shuukichi, to Nippondenso Co., Ltd. Method and apparatus for controlling an internal combustion engine. 4,501,250, Cl. 123-486.000.

Omori, Shigenori: *See*—
Mizuhara, Hisayoshi; Omori, Shigenori; and Tanaka, Akira, 4,501,547, Cl. 425-391.000.

Onder, Kemal: *See*—
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, 4,501,844, Cl. 524-451.000.

Ong, Robert. Method for forming and holding cheese fish bait. 4,501,083, Cl. 43-4.500.

Ono, Kuniaki: *See*—
Wakabayashi, Masaru; and Ono, Kuniaki, 4,501,314, Cl. 164-441.000.

Ono, Shusuke: *See*—
Mitsuyu, Tsuneo; Ono, Shusuke; Inaba, Ritsuo; and Wasa, Kiyotaka, 4,501,987, Cl. 310-313.00A.

Ooga, Tomonari: *See*—
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, 4,501,802, Cl. 428-629.000.

Oomen, Joris J. C.: *See*—
Driessen, Antonius J. G. C.; Geertsema, Eise B.; Oomen, Joris J. C.; and Rouwendal, Jan W., 4,501,799, Cl. 428-446.000.

Oota, Tadaki: *See*—
Yamamoto, Tadahiro; and Oota, Tadaki, 4,501,709, Cl. 261-44.00D.

Ootani, Tsuyoshi: *See*—
Takeuchi, Takashi; Kobayashi, Syoji; Ootani, Tsuyoshi; and Imamura, Tetsuya, 4,501,795, Cl. 428-329.000.

Orain, Michel A., to Glaenzer Spicer. Large operating angle constant-speed joint. 4,501,571, Cl. 464-111.000.

Orr, Donald: *See*—
Causer, Roy; and Orr, Donald, 4,501,522, Cl. 414-4.000.

Osako, Kazuyoshi: *See*—
Fujiwara, Katsuhiro; and Osako, Kazuyoshi, 4,502,112, Cl. 364-200.000.

Osato, Yoichi: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,501,807, Cl. 430-57.000.

Osborne, Robert L.: *See*—
Wonn, James W.; and Osborne, Robert L., 4,502,046, Cl. 340-682.000.

Oschatz, Christian, to Sandoz Ltd. Process for dyeing or printing sized textiles. 4,501,589, Cl. 8-495.000.

Osterberg, Lars B., to Nordiskafilt AB. Forming fabric. 4,501,303, Cl. 139-425.00A.

Ostlinning, Edgar; and Idel, Karsten, to Bayer Aktiengesellschaft. Process for the production of optionally branched polyarylene sulphide with piperazinone solvent. 4,501,884, Cl. 528-388.000.

Ota, Naoto: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,501,999, Cl. 318-632.000.

Ota, Yoshio: *See*—
Furuno, Nobuo; Ota, Yoshio; Itai, Masahiro; Tokuyama, Akio; and Nakano, Eiichi, 4,501,649, Cl. 204-181.00R.

Otaki, Yoshio. Guardrail for roadway. 4,501,411, Cl. 256-13.100.

Otis Elevator Company: *See*—
Salihi, Jalal T., 4,501,343, Cl. 187-29.00R.

Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Graphic Communications Systems, Inc. Variable density scanner. 4,502,081, Cl. 358-280.000.

Otsuka, Kenichi: *See*—
Nishikawa, Akira; Saito, Toru; and Otsuka, Kenichi, 4,502,132, Cl. 361-332.000.

Otting, Billy J., to Otting International, Inc. Method and apparatus for spray treating textile material. 4,501,038, Cl. 8-151.000.

Otting International, Inc.: *See*—
Otting, Billy J., 4,501,038, Cl. 8-151.000.

Outboard Marine Corporation: *See*—
Blanchard, Clarence E., 4,501,562, Cl. 440-61.000.

Outokumpu Oy: *See*—
Kuusikko, Matti J.; and Rantala, Olavi K., 4,501,526, Cl. 414-173.000.

Owens-Illinois, Inc.: *See*—
Smalley, Ned J., 4,501,371, Cl. 215-232.000.

Owens, Walton D.: *See*—
Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., 4,501,072, Cl. 34-1.000.

Oxborrow, Bernard H.: *See*—
Griffin, Christopher J.; and Oxborrow, Bernard H., 4,501,104, Cl. 53-48.000.

Ozawa, Jun; Shindo, Katuji; and Shirakawa, Shingo, to Hitachi, Ltd. Lightning arrester. 4,502,089, Cl. 361-127.000.

Pace, Aldren M.: *See*—
Foerster, Charles E., Jr.; Miller, Robert E.; and Pace, Aldren M., 4,501,972, Cl. 250-577.000.

Pacheco, Benjamin G.: *See*—
Valdes, Guillermo A.; Figueredo, Fernando F.; Pacheco, Benjamin G.; and Framil, Armando, 4,501,310, Cl. 144-34.00R.

Pachonik, Horst, to Siemens Aktiengesellschaft. Regenerable electric layer capacitor. 4,502,095, Cl. 361-273.000.

Paersch, Michael; Mrotzek, Herbert; Haukelt, Helmut; and Schreckenberg, Heinz-Wilhelm, to British Petroleum Company p.l.c., The. Process for the production of agglomerated fuels. 4,501,593, Cl. 44-23.000.

Pahade, Ravindra F., to Union Carbide Corporation. Process to separate nitrogen from natural gas. 4,501,600, Cl. 62-28.000.

Palazzetti, Mario: *See*—
Walther, Helmut; and Palazzetti, Mario, 4,501,406, Cl. 251-30.000.

Palguta, Stephen E.: *See*—
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,501,037, Cl. 8-149.200.

Palley, Igor: *See*—
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., 4,501,856, Cl. 525-240.000.

Palmer, Donald F., III. Manhole cover and assembly for tank for transporting flammable liquids. 4,501,377, Cl. 220-314.000.

Palmer, John R., to Upjohn Company, The. Preparing 1-(hydroxymethyl)-triazolobenzodiazepines and 1-(aminomethyl)-triazolobenzodiazepines. 4,501,698, Cl. 260-245.500.

Palomera, Louis M. Carpenter's level holding device and method for plumbing a wall partition. 4,501,057, Cl. 29-407.000.

Palson, Richard C. J., to Phillips Manufacturing Company, The. Pocketknife hone. 4,501,068, Cl. 30-138.000.

Pandey, Ramesh C.; Toussaint, Margaret W.; McGuire, Jeffrey C.; and Thomas, Monica C., to Litton Bionetics, Inc. Maggiemycin, anhydromaggiemycin and processes for making. 4,501,699, Cl. 260-351.100.

Papanu, Victor D., to Monsanto Company. Polymeric antitumor agent. 4,501,847, Cl. 524-502.000.

Papst-Motoren GmbH & Co KG: *See*—
Muller, Rolf, 4,501,997, Cl. 318-254.000.

Papst Motoren KG: *See*—
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Parikh, Niranjan M.: *See*—
Bauer, Carl F.; Hussey, James H.; Langston, Benny; and Parikh, Niranjan M., 4,501,614, Cl. 75-257.000.

Park, Jong S. Disk jacket. 4,501,357, Cl. 206-312.000.

Park-Ohio Industries, Inc.: *See*—
Lewis, John C., 4,501,942, Cl. 219-10.430.

Parks, Christ F.; and Nimerick, Kenneth H., to Dow Chemical Company, The. Method for reducing the strength of ice. 4,501,775, Cl. 427-220.000.

Partis, Richard A.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,501,895, Cl. 548-239.000.

Partridge, Randell D.: *See*—
LaPierre, Rene B.; Partridge, Randell D.; Chen, Nai Y.; and Wong, Steven S., 4,501,926, Cl. 585-739.000.

Partus, Fred P., to AT&T Technologies, Inc. Apparatus for supplying fluid to a rotating tube. 4,501,442, Cl. 285-190.000.

Pauliukonis, Richard S. Fluid proportioning diverter valve. 4,501,289, Cl. 137-315.000.

Pawelzik, Manfred; and Derr, Max, to Friedrich Grohe Armaturenfabrik GmbH & Co. Volume control valve. 4,501,408, Cl. 251-314.000.

Payne, Vay B. Target apparatus. 4,501,427, Cl. 273-406.000.
PDA Engineering: *See*—
Schutzler, Jerome C., 4,501,058, Cl. 29-446.000.
Pecheux, Jean-Claude, to Societe Anonyme: Compagnie Generale de Materiel Orthopedique. Traction-suspension device with transosseous pin. 4,501,267, Cl. 128-84.00R.
Peddinghaus, Rolf. Heavy-duty selective embossing apparatus. 4,501,507, Cl. 400-134.000.
Pedicano, Ernest A.: *See*—
Kane, James G.; Pedicano, Ernest A.; and Pedicano, James, 4,501,421, Cl. 272-96.000.
Pedicano, James: *See*—
Kane, James G.; Pedicano, Ernest A.; and Pedicano, James, 4,501,421, Cl. 272-96.000.
Pedtke, Daniel F.: *See*—
Carl, Robert H., Jr.; Koontz, Floyd; and Pedtke, Daniel F., 4,502,025, Cl. 333-24.00R.
Peffer, John R.: *See*—
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,501,872, Cl. 528-18.000.
Peisker, Glenn; Christiansen, Keith; and Jaime, Gil, to Chicago Rawhide Manufacturing Company. Composite teflon helix seal. 4,501,431, Cl. 277-134.000.
Pelikan, Robert W. Liquid flow indicator and valve device. 4,501,158, Cl. 73-861.580.
Pennsylvania Engineering Corporation: *See*—
Loukos, Isaias, 4,501,599, Cl. 55-71.000.
Pennwalt Corporation: *See*—
Wu, Edwin S., 4,501,755, Cl. 514-456.000.
Pennzoil Company: *See*—
Magyar, Arpad M.; and Smith, Gerald G., 4,501,825, Cl. 521-78.000.
Penzien, Joseph, to University of California, The Regents of the. Structure failure detector with signal transmission through the structure itself. 4,502,041, Cl. 340-532.000.
Periasamy, Muthunadar P., to Mallinckrodt, Inc. Preparation of trimethoxybenzoate salts and trimethoxybenzoic acid. 4,501,920, Cl. 562-473.000.
Perlat, Milan, to Automatic Roller Doors Australia, Pty., Ltd. Reversing device for roller doors. 4,501,963, Cl. 250-231.0SE.
Perkins, Eugene W. Heating system with liquid pre-heating. 4,501,231, Cl. 122-26.000.
Perkinson, Robert H.; Donnelly, Brian G.; and Dudash, Carl S., to United Technologies Corporation. Vortex shedding flow measuring transducer. 4,501,157, Cl. 73-861.240.
Perlman, Marvin; and Goldfine, Milton, to Trans-Cryption, Inc. Verifier for a personal indentification system. 4,501,957, Cl. 235-379.000.
Perplies, Eberhard: *See*—
Kornrumpf, Wolfgang; Perplies, Eberhard; Hilbig, Josef; and Feicht, Utz-Hellmuth, 4,501,887, Cl. 536-84.000.
Personal Peripherals Inc.: *See*—
Hyltin, Tom M.; Milner, Thomas G.; and Frye, Elam C., Jr., 4,501,939, Cl. 200-6.00A.
Personal Products Company: *See*—
Holtman, Dennis C., 4,501,586, Cl. 604-380.000.
Pescatore, Eugene A., to Electro-Biology, Inc. Applicator head for electromagnetic treatment of an afflicted body region. 4,501,265, Cl. 128-1.500.
Peszeszer, Endre F.: *See*—
Yampolsky, Jack S.; and Peszeszer, Endre F., 4,501,948, Cl. 219-121.0LC.
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Sakaguchi, Yoshihito: *See—*
Imose, Masayuki; Seno, Takao; and Sakaguchi, Yoshihito, 4,501,553, Cl. 432-59.000.
Sakai, Kiyoshi; Ishikawa, Shozo; Arita, Tetsuo; Mabuchi, Minoru; and Umehara, Shoji, to Canon Kabushiki Kaisha. Recording medium and process employing a photosensitive organic film. 4,501,808, Cl. 430-59.000.
Sakakibara, Toshimori: *See—*
Sugimori, Masaru; Sanji, Koichiro; Tomoyasu, Hirohide; and Sakakibara, Toshimori, 4,501,853, Cl. 525-122.000.
Sakakibara, Yasuji: *See—*
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Sakamoto, Shinichi: *See—*
Amano, Matsuo; Sakamoto, Shinichi; Hirayama, Takeshi; and Sasayama, Takao, 4,501,249, Cl. 123-478.000.
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, to Mitsui Toatsu Kaguku Kabushiki Kaisha. Thiazole compounds, a process for preparing same and a pharmaceutical composition containing the thiazole compounds. 4,501,750, Cl. 514-369.000.
Sakanoue, Kei: *See—*
Hirano, Shigeo; and Sakanoue, Kei, 4,501,898, Cl. 548-336.000.
Salihi, Jalal T., to Otis Elevator Company. Elevator car load and position dynamic gain compensation. 4,501,343, Cl. 187-29.00R.
Saller, Kenneth R.: *See—*
Nelson, David A.; and Saller, Kenneth R., 4,502,020, Cl. 330-265.000.
SALUS Ricerca e Sviluppo di CROCE' Dr. Francesco & C. Snc: *See—*
Breda, Enzo; and Ciotti, Alfredo, 4,501,491, Cl. 356-39.000.
Salvagni, Edward A.: *See—*
Nicholas, John F.; and Salvagni, Edward A., 4,502,015, Cl. 329-166.000.
Salvat, Francois: *See—*
Dupressoir, Albert; and Salvat, Francois, 4,502,053, Cl. 343-727.000.
SAME S.p.A.: *See—*
Pitozzi, Luigi, 4,501,237, Cl. 123-196.00W.
Samec, Jean: *See—*
Groult, Alain; and Samec, Jean, 4,501,681, Cl. 252-174.120.
Sanders, Richard L., to Lockheed Corporation. Automatic threaded nut installation and torquing system. 4,501,176, Cl. 81-470.000.
Sandiford, Burton B.; Fett, E. Reinoki; and Bickford, Harold J., to Union Oil Company of California. Method for identifying the source of an oil. 4,501,324, Cl. 166-250.000.
Sandorff, Paul E., to Lockheed Corporation. Beam balancer electro-impulse deicing systems. 4,501,398, Cl. 244-134.00R.
Sandoz Ltd.: *See—*
Connell, David L.; and Coates, Jacqueline A., 4,501,672, Cl. 252-8.50M.
Oschatz, Christian, 4,501,589, Cl. 8-495.000.
Saneyoshi, Norio: *See—*
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Sanji, Koichiro: *See—*
Sugimori, Masaru; Sanji, Koichiro; Tomoyasu, Hirohide; and Sakakibara, Toshimori, 4,501,853, Cl. 525-122.000.
Sannomiya, Kunio: *See—*
Otsuka, Hirotaka; Uchida, Hideo; Uno, Yoshihiro; Nakazato, Katsuo; Sannomiya, Kunio; Kawakami, Hidehiko; and Tsuchiya, Hiroshi, 4,502,081, Cl. 358-280.000.
Sano, Mineo: *See—*
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Sano, Shinichi: *See—*
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Sanofi: *See—*
Nisato, Dino; Boveri, Sergio; Roncucci, Romeo; and Carminati, Paolo, 4,501,747, Cl. 514-342.000.
Santo, Philip J. Floatation sleep system. 4,501,036, Cl. 5-452.000.
Sarada, Thyagaraja, to Celanese Corporation. Surfactant treated polyolefinic microporous materials capable of multiple re-wetting with aqueous solutions. 4,501,793, Cl. 428-315.500.

Sasayama, Takao: *See—*
Amano, Matsuo; Sakamoto, Shinichi; Hirayama, Takeshi; and Sasayama, Takao, 4,501,249, Cl. 123-478.000.

Sashida, Mitsuaki: *See—*
Matsui, Fumio; and Sashida, Mitsuaki, 4,501,480, Cl. 354-298.000.

Satake, Toshimi; Maruyama, Kazuo; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 4,502,066, Cl. 346-209.000.

Sato, Hisao: *See—*
Arabori, Yoshinari; and Sato, Hisao, 4,501,945, Cl. 219-10.55F.

Sato, Hitoshi: *See—*
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Sato, Takeshi: *See—*
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Satoh, Osamu: *See—*
Mashimo, Tohru; Nishio, Takashi; and Satoh, Osamu, 4,501,199, Cl. 102-313.000.

Satzler, Ronald L., to Caterpillar Tractor Co. Method and apparatus for extruding reinforced hose. 4,501,629, Cl. 156-149.000.

Saurenman, Donald G. Positive and negative ion distributor bar. 4,502,091, Cl. 361-213.000.

Saurenman, Donald G., to Consan Pacific Incorporated. Control of static neutralization employing cables and wires. 4,502,093, Cl. 361-231.000.

Savin Corporation: *See—*
Landa, Benzion, 4,501,486, Cl. 355-15.000.

Scans Associates, Inc.: *See—*
Foerster, Charles E., Jr.; Miller, Robert E.; and Pace, Aldren M., 4,501,972, Cl. 250-577.000.

Scardovi, Alessandro: *See—*
Brescia, Riccardo; Buat, Mario; Dagna, Giandomenico; and Scardovi, Alessandro, 4,502,054, Cl. 346-75.000.

Sceberras, Conrad T. Dual headed razor system. 4,501,066, Cl. 30-50.000.

Schaake, Herbert F.: *See—*
Tregilgas, John H.; Beck, Jeffrey D.; Kinch, Michael A.; and Schaake, Herbert F., 4,501,625, Cl. 148-20.300.

Schafer, Gerhard, to Fritz Schafer Gesellschaft Mit Beschrankterhaftung. Storage rack with multiple drawer compartments and mold for making same. 4,501,456, Cl. 312-273.000.

Schaller, Dieter: *See—*
Muller, Alfred; Schaller, Dieter; and Schwab, Manfred, 4,501,170, Cl. 74-866.000.

Schecter, Steven M.: *See—*
Mahlmann, James P.; Schecter, Steven M.; and Scher, Lawrence, 4,501,761, Cl. 426-467.000.

Scheffer, Hans: *See—*
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,501,639, Cl. 159-48.100.

Schenectady Chemicals, Inc.: *See—*
Walrath, George A.; and Smith, Scott D., 4,501,883, Cl. 528-340.000.

Scher, Lawrence: *See—*
Mahlmann, James P.; Schecter, Steven M.; and Scher, Lawrence, 4,501,761, Cl. 426-467.000.

Schijf, Robert: *See—*
Gercama, Anne; and Schijf, Robert, 4,501,764, Cl. 426-607.000.

Schindler, John A. Current pulse monitor. 4,502,004, Cl. 324-103.00P.

Schingnitz, Manfred: *See—*
Kretschmer, Horst; Tietze, Gunter; Beiermann, Norbert; Schingnitz, Manfred; and Goehler, Peter, 4,501,156, Cl. 73-861.040.

Schlumberger Technology Corporation: *See—*
Clavier, Christian M.; Dumanoir, Jean L.; and Dumestre, Alexis C., 4,502,121, Cl. 364-422.000.

Schmider, Fritz, to Papst Motoren KG. Electric machine. 4,501,983, Cl. 310-113.000.

Schmidt, Hans-Joachim; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for carbonylating formaldehyde acetals. 4,501,917, Cl. 560-187.000.

Schmidt, James C., to A. E. Staley Manufacturing Company. Process for producing esters of carbohydrate materials. 4,501,888, Cl. 536-110.000.

Schmidt, Peter: *See—*
Jacoby, Hans-Dieter; and Schmidt, Peter, 4,501,527, Cl. 414-225.000.

Schmidt, Rudolf: *See—*
Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,501,516, Cl. 405-260.000.

Schneider, Andre, to Compagnie Generale des Etablissements Michelin. Riders for trapezoidal drive belt. 4,501,578, Cl. 474-201.000.

Schneider, Gottfried: *See—*
Landwehrkamp, Hans; and Schneider, Gottfried, 4,501,221, Cl. 118-78.000.

Schneider, Karl-Heinz: *See—*
Schulze, Hans-Horst; Loweg, Heribert; and Schneider, Karl-Heinz, 4,501,044, Cl. 15-312.00R.

Schoenrock, Karlheinz W. R.; Henscheid, Thomas H.; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for producing a high fructose sweetener, high protein meal, and cereal germ oils. 4,501,814, Cl. 435-94.000.

Scholz, Adolf: *See—*
Weis, Martin; and Scholz, Adolf, 4,501,313, Cl. 164-404.000.

Schonung, Bernhard: *See—*
von Ronai-Horvath, Michael; and Schonung, Bernhard, 4,501,114, Cl. 57-81.000.

Schoop, Gunther D.: *See—*
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Schreck, Ronald: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,501,762, Cl. 426-538.000.

Schreckenberg, Heinz-Wilhelm: *See—*
Paersch, Michael; Mrotzek, Herbert; Haukelt, Helmut; and Schreckenberg, Heinz-Wilhelm, 4,501,593, Cl. 44-23.000.

Schreiber, David A.: *See—*
Fenton, Edward A., Jr.; Lakin, Ira W.; Stein, Joseph H.; Lohr, John R.; and Schreiber, David A., 4,501,539, Cl. 425-84.000.

Schroder, Ulf; and Mosbach, Klaus. Intravascularly administrable, magnetically responsive nanosphere or nanoparticle, a process for the production thereof, and the use thereof. 4,501,726, Cl. 424-1.100.

Schubert & Salzer: *See—*
Schuller, Edmund; Mayer, Walter; Hini, Eugen; Bock, Erich; and Lovas, Kurt, 4,501,116, Cl. 57-263.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Landwehrkamp, Hans; and Schneider, Gottfried, 4,501,221, Cl. 118-78.000.

Schuh, Gottfried, to Siemens Aktiengesellschaft. Contact for an MIS-semiconductor component and method for manufacturing the same. 4,502,069, Cl. 357-23.400.

Schuller, Edmund; Mayer, Walter; Hini, Eugen; Bock, Erich; and Lovas, Kurt, to Schubert & Salzer. Process for winding a newly joined thread onto a tube newly inserted in a spooling device. 4,501,116, Cl. 57-263.000.

Schultheiss, Hartmut: *See—*
Horig, Joachim; and Schultheiss, Hartmut, 4,501,733, Cl. 514-17.000.

Schultz, Samuel: *See—*
Boisvert, J. Roger; Schultz, Samuel; and Blaugrund, Robert, 4,501,088, Cl. 43-118.000.

Schulz, Volker. Perfusion kit. 4,501,582, Cl. 604-52.000.

Schulze, Hans-Horst; Loweg, Heribert; and Schneider, Karl-Heinz, to Gewerkschaft Eisenhutte Westfalia. Apparatus for cleaning components used in electrolytic smelting. 4,501,044, Cl. 15-312.00R.

Schuster, Klaus: *See—*
Bartl, Herbert; Alberts, Heinrich; and Schuster, Klaus, 4,501,871, Cl. 527-313.000.

Schutzler, Jerome C., to PDA Engineering. Method of pre-stressing a structural member. 4,501,058, Cl. 29-446.000.

Schwab, Manfred: *See—*
Muller, Alfred; Schaller, Dieter; and Schwab, Manfred, 4,501,170, Cl. 74-866.000.
Muller, Alfred; and Schwab, Manfred, 4,501,171, Cl. 74-866.000.

Schwartz, Harold: *See—*
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Schwarz, Manfred: *See—*
Stumpp, Gerhard; Vogtmann, Hans-Jorg; Fussner, Paul; Schwarz, Manfred; Hofer, Gerald; Konrath, Karl; Straubel, Max; and Faupel, Werner, 4,501,252, Cl. 123-502.000.

Scott Investment Partners: *See—*
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Scott, James J., to Scott Investment Partners. Dynamic rock stabilizing fixture. 4,501,515, Cl. 405-259.000.

Scott, Lewis A.; and Gibson, Duane M., to Omark Industries, Inc. Cutting tool with improved depth control. 4,501,184, Cl. 83-834.000.

Sears Manufacturing Co.: *See—*
Bethell, George L.; Burch, Donald F.; and Hinkhouse, Lysle R., 4,501,541, Cl. 425-117.000.

Sebestyen, Gyula: *See—*
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,501,732, Cl. 424-114.000.

Seike, Stephen C.: *See—*
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Seiner, Jerome A.: *See—*
Hodek, Robert B.; and Seiner, Jerome A., 4,501,821, Cl. 502-155.000.

Seitz, John R. Bowling game. 4,501,426, Cl. 273-277.000.

Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, to Showa Denko Kabushiki Kaisha. Herbicidal 5-t-butyl-3-pyrazalylcarbamates and ureas. 4,501,606, Cl. 71-92.000.

Seko, Yasutoshi: *See—*
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,502,122, Cl. 364-424.000.

Selleck, Franklin G.: *See—*
Drinkuth, William H.; Bires, Robert J.; Miller, Robert J.; and Selleck, Franklin G., 4,501,095, Cl. 51-165.720.

Selter, Gustav: *See—*
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Selter, Jutta: *See—*
Kretzschmar, Gisela; and Selter, Jutta, 4,501,133, Cl. 66-117.000.

Seluga, David M.: *See—*
McGuire, Michael L.; Seluga, David M.; and Blum, Michael R., 4,501,628, Cl. 156-62.800.

Semco Instruments, Inc.: *See—*
Moore, M. Samuel, 4,502,043, Cl. 340-588.000.

Sen, Rajat K.: *See*—
Hardee, Kenneth L.; Gordon, Arnold Z.; Pyle, Charles B.; and Sen, Rajat K., 4,501,824, Cl. 502-339.000.
Seneca, Joseph T. Belt-like ornamental member. 4,501,026, Cl. 2-308.000.
Senko Medical Instrument Mfg., Co., Ltd.: *See*—
Nakanishi, Hikaru, 4,501,785, Cl. 428-195.000.
Seno, Takao: *See*—
Imose, Masayuki; Seno, Takao; and Sakaguchi, Yoshihito, 4,501,553, Cl. 432-59.000.
Senuma, Akitaka; Shimizu, Yoshihiko; and Tsukada, Kiroku, to Union Carbide Corporation. Process and composition for producing open-cell cross linked polyolefin film. 4,501,711, Cl. 264-54.000.
Seo, Yasutsugu, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic blood flow sensing apparatus. 4,501,279, Cl. 128-663.000.
Seyama, Tuneo, to Kabushiki Kaisha Niida Seisakusho. Lock stitch type hand sewing machine. 4,501,211, Cl. 112-169.000.
Seyle, Robert A. Self propelled trench shield. 4,501,517, Cl. 405-283.000.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
Siligoni, Marco; and Rossetti, Nazareno, 4,501,933, Cl. 179-81.00R.
Siligoni, Marco; and Consiglio, Pietro, 4,502,016, Cl. 330-146.000.
Shah, Pravinchandra K.; and Antlfinger, George J., to B. F. Goodrich Company, The. Latex containing odor inhibitor. 4,501,789, Cl. 428-274.000.
Shaheen, Joseph M.: *See*—
Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., 4,501,929, Cl. 174-117.00F.
Shankar, Srinivasan, to Turbine Components Corporation. Methods of forming a protective diffusion layer on nickel, cobalt and iron base alloys. 4,501,776, Cl. 427-253.000.
Shannon, Patrick A.: *See*—
Fowler, Glenn D.; Shannon, Patrick A.; Stout, Ronald L.; and Yao, Jean, 4,502,116, Cl. 364-200.000.
Shapir, Ben A., to Avmat Computers Ltd. Page printer. 4,502,064, Cl. 346-160.000.
Shapiro, Justin J.: *See*—
MacDermott, Bruce R.; and Shapiro, Justin J., 4,501,163, Cl. 73-864.130.
Sharp Kabushiki Kaisha: *See*—
Furukawa, Toshio, 4,501,281, Cl. 128-680.000.
Ohnishi, Souichi; and Shiono, Fusahiro, 4,502,120, Cl. 364-405.000.
Shaulov, Avner, to North American Philips Corporation. Broad band pyroelectric infrared detector. 4,501,967, Cl. 250-338.000.
Shaw, Frank W.: *See*—
Thayer, Timothy Z.; and Shaw, Frank W., 4,501,118, Cl. 60-301.000.
Shell Oil Company: *See*—
Grundy, Andrew K.; and Versluis, Jan, 4,501,525, Cl. 414-139.000.
Harris, Martin, 4,501,742, Cl. 514-226.000.
Shone, Edward B.; Wilson, Robert W.; and Cunningham, Gordon L., 4,501,124, Cl. 62-129.000.
Shepherd, Charles E. Repair pad and nozzle for cooling tower. 4,501,708, Cl. 261-111.000.
Sherk, Fred T.; and Inkrott, Janet L., to Phillips Petroleum Company. Diluent and inert gas recovery from a polymerization process. 4,501,885, Cl. 528-501.000.
Sherman, Frank E. Hinge template guide with holding pins. 4,501,308, Cl. 144-144.500.
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., to Kamyr, Inc. Leaching and washing a flocculated slurry having a fiber content. 4,501,721, Cl. 423-27.000.
Shibayama, Tooru; Kajiya, Hiroshi; and Takahashi, Mitsuharu, to Kabushiki Kaisha Sato. Continuous tag printing apparatus. 4,501,224, Cl. 118-697.000.
Shigematsu, Kaisaburo; Shigematsu, Nobuo; and Okubo, Yukio, to Shigematsu Works Co., Ltd. Mask. 4,501,272, Cl. 128-206.150.
Shigematsu, Nobuo: *See*—
Shigematsu, Kaisaburo; Shigematsu, Nobuo; and Okubo, Yukio, 4,501,272, Cl. 128-206.150.
Shigematsu Works Co., Ltd.: *See*—
Shigematsu, Kaisaburo; Shigematsu, Nobuo; and Okubo, Yukio, 4,501,272, Cl. 128-206.150.
Shimizu, Yoshihiko: *See*—
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Shimotsuma, Wataru: *See*—
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Shimura, Akira, to Ricoh Company, Ltd. Photoconductive element cleaning apparatus and residual toner collecting apparatus. 4,501,484, Cl. 355-15.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,501,801, Cl. 428-447.000.
Ueno, Susumu; Kuroda, Kouiti; Kitamura, Hajime; Tohkai, Masaie; Kato, Ken-ichi; and Hiraishi, Nobuyuki, 4,501,428, Cl. 277-12.000.
Shindo, Katuji: *See*—
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Shinko Electric Co., Ltd.: *See*—
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Shinoda, Yoshio: *See*—
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Shinshu Seiki Kabushiki Kabushiki Kaisha Suwa Seikosha: *See*—
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Shiono, Fusahiro: *See*—
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Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, to Canon Kabushiki Kaisha. Photoconductive member having an amorphous silicon layer. 4,501,807, Cl. 430-57.000.
Shiraimatsu Shinyaku Company Ltd.: *See*—
Torii, Kuniyoshi; and Egma, Chikashi, 4,501,730, Cl. 424-76.000.
Shirakawa, Shingo: *See*—
Ozawa, Jun; Shindo, Katuji; and Shirakawa, Shingo, 4,502,089, Cl. 361-127.000.
Shone, Edward B.; Wilson, Robert W.; and Cunningham, Gordon L., to Shell Oil Company. Apparatus for leakage detection of cryogenic materials. 4,501,124, Cl. 62-129.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,501,378, Cl. 220-324.000.
Showa Denko Kabushiki Kaisha: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,501,606, Cl. 71-92.000.
Siegrist, Ronald, to Vickers, Incorporated. Relief valve arrangement. 4,501,291, Cl. 137-529.000.
Siemens Aktiengesellschaft: *See*—
Dondl, Peter, 4,502,051, Cl. 343-356.000
Douklias, Nikolaos, 4,501,492, Cl. 356-73.100.
Fromm, Ingrid, 4,502,045, Cl. 340-671.000.
Herberg, Helmut, 4,502,071, Cl. 357-38.000.
Herberg, Helmut, 4,502,072, Cl. 357-38.000.
Hieber, Konrad; and Wieczorek, Claudia, 4,501,769, Cl. 427-95.000.
Leipold, Ludwig; Stengl, Jens P.; and Tihanyi, Jeno , 4,502,070, Cl. 357-38.000.
Lutz, Roman, 4,501,930, Cl. 178-4.000.
Pachonik, Horst, 4,502,095, Cl. 361-273.000.
Schuh, Gottfried, 4,502,069, Cl. 357-23.400.
Stahl, Jochen, 4,501,990, Cl. 313-299.000.
Stebegg, Josef; and Becke, Gerhart, 4,501,463, Cl. 339-99.00R.
Siemens Aktiengesellschaft Berlin & Munchen: *See*—
Bajka, Imre; and Furrer, Robert, 4,501,770, Cl. 427-97.000.
Sievert, James A., to Minnesota Mining and Manufacturing Company. Apparatus and method for sealing splices in insulated electrical cables. 4,501,927, Cl. 174-93.000.
Signetics Corporation: *See*—
West, Jeffery A.; and Fletcher, Thomas D., 4,501,976, Cl. 307-456.000.
Signode Corporation: *See*—
Urban, Clement A.; and Huson, Gale W., 4,501,356, Cl. 206-83.500.
Sika AG, vorm. Kaspar Winkler & Co.: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,501,839, Cl. 524-247.000.
Siligoni, Marco; and Rossetti, Nazareno, to SGS-ATES Componenti Elettronici S.p.A. Transistor bridge voltage rectifier circuit. 4,501,933, Cl. 179-81.00R.
Siligoni, Marco; and Consiglio, Pietro, to SGS-ATES Componenti Elettronici S.p.A. Final bridge stage for a receiver audio amplifier. 4,502,016, Cl. 330-146.000.
Silverman, Harold: *See*—
Foster, Dean H.; and Silverman, Harold, 4,501,417, Cl. 271-124.000.
Sinclair, Walter, to Lucas Industries Limited. Low current linear/high current chopper voltage regulator. 4,502,152, Cl. 455-73.000.
Sinden, Leon. Portable wood splitter. 4,501,309, Cl. 144-193.00A.
Singer, Debra L.; McCollum, Gregory J.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Aminoplast curable compositions containing disulfonic acid esters as latent acid catalysts. 4,501,854, Cl. 525-162.000.
Singer, Erich: *See*—
Gassler, Hermann; Joos, Eugen; Kubach, Hans; Maisch, Wolfgang; and Singer, Erich, 4,501,247, Cl. 123-453.000.
Siry, Manfred; and Diesel, Hans-Dieter, to Letron GmbH. Multi-layer board possessing a varnish surface, process for its production and its use. 4,501,635, Cl. 156-273.300.
Siryj, Bohdan W.; and Lazzery, Angelo G., to RCA Corporation. Automatic handling mechanism for an optical disc enclosed in a protective cartridge. 4,502,133, Cl. 369-34.000.
Sisler, John R., to Convergent Technologies, Inc. Modular housing for computer system. 4,501,460, Cl. 339-49.00R.
SKF Kugellagerfabriken GmbH: *See*—
von Ronai-Horvath, Michael; and Schonung, Bernhard, 4,501,114, Cl. 57-81.000.
Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See*—
Kopp, Ernst, 4,501,078, Cl. 36-121.000.
Skjaerpe, Finn. Microsurgical instrument. 4,501,274, Cl. 128-305.000.
Slade, A. MacDonald: *See*—
Weatherly, Gilbert; and Slade, A. MacDonald, 4,501,782, Cl. 428-57.000.
Slattery, Ian, to Spencer Wright Industries, Inc. Tufting machines. 4,501,212, Cl. 112-266.200.
Sleger, Leon F.: *See*—
DiNozzi, Robert D.; Vancelette, Stanley R.; Powell, Lionel E.; McLean, George F., Jr.; Sleger, Leon F.; and Mason, Ronald C., 4,501,064, Cl. 29-832.000.
Sloan, Albert H. Protective control system for engine. 4,502,090, Cl. 361-153.000.

Slomski, Bruce A.: *See*—
Ryan, Charles W.; and Slomski, Bruce A., 4,501,921, Cl. 564-99.000.

Smalley, Ned J., to Owens-Illinois, Inc. Tamper indicating, non-reseala-ble closure. 4,501,371, Cl. 215-232.000.

Smith, Don L.; and Smith, Shirley J., to Smith, Don L.; and Smith, Shirley J. Yeast and dough condition compositions. 4,501,757, Cl. 426-62.000.

Smith, Gerald G.: *See*—
Magyar, Arpad M.; and Smith, Gerald G., 4,501,825, Cl. 521-78.000.

Smith International, Inc.: *See*—
Geczy, Bela A., 4,501,521, Cl. 411-217.000.
Underwood, Lance D., 4,501,338, Cl. 175-229.000.

Smith, Rocky D.: *See*—
Jacobi, Cecil T., Jr.; Maupin, Charles G.; Woodsmall, James B.; Brown, William J.; Thomas, Bruce E.; Owens, Walton D.; Cunningham, Robert J.; and Smith, Rocky D., 4,501,072, Cl. 34-1.000.

Smith, Scott D.: *See*—
Walrath, George A.; and Smith, Scott D., 4,501,883, Cl. 528-340.000.

Smith, Shirley J.: *See*—
Smith, Don L.; and Smith, Shirley J., 4,501,757, Cl. 426-62.000.

Smith, Thomas G., to Pneuveyor Systems Limited. Automatic pneumatic feeder. 4,501,518, Cl. 406-25.000.

SmithKline Beckman Corporation: *See*—
Faulkner, Albert A.; and Bouton, John C., 4,501,495, Cl. 356-244.000.

Snow, Roger L., Sr.; and Atkinson, Thomas J. Pipe thread protector. 4,501,301, Cl. 138-96.00T.

Snyder General Corporation: *See*—
Trigourea, Spiridon, 4,501,193, Cl. 98-33.100.

Societe Anonyme: Compagnie Generale de Materiel Orthopedique: *See*—
Pecheux, Jean-Claude, 4,501,267, Cl. 128-84.00R.

Societe Anonyme des Usines Chausson: *See*—
Hoyer, Francis L. E., 4,501,387, Cl. 228-183.000.

Societe Lorraine de Laminage Continu SOLLAC: *See*—
Druet, Jean-Pierre, 4,501,609, Cl. 75-5.000.

Societe Nationale d'Etude de Construction de Moteurs d'Aviation: *See*—
Canivet, Guy M. C., 4,501,117, Cl. 60-235.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Castel, Yvon; and Iato, Michel, 4,501,056, Cl. 29-252.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Jardat, Alain; and Andre , Joel, 4,501,182, Cl. 83-177.000.
Rodiere, Charles; and Crochet, Michel, 4,502,009, Cl. 324-337.000.

Soerens, Dave A., to Kimberly-Clark Corporation. Creping adhesives containing polyvinyl alcohol and cationic polyamide resins. 4,501,640, Cl. 162-111.000.

Sokolowski, Robert S., to Olin Corporation. Casting system having lubricated casting nozzles. 4,501,317, Cl. 164-472.000.

Somezawa, Masashi: *See*—
Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,501,801, Cl. 428-447.000.

Sommers, Hans; and Jannemann, Theo, to Ruhrgas Aktiengesellschaft. Heating system incorporating an absorption-type heat pump and methods for the operation thereof. 4,501,127, Cl. 62-238.300.

Sonobond Ultrasonics, Inc.: *See*—
Irwin, Charles; Devine, Janet; and Kramer, Richard, 4,501,285, Cl. 134-58.00R.

Sonoda, Nobuo: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,501,686, Cl. 252-500.000.

Sony Corporation: *See*—
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,501,465, Cl. 339-176.0MP.
Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,501,801, Cl. 428-447.000.
Kubota, Shigeo, 4,501,493, Cl. 356-123.000.

Sotnikov, Ivan A.: *See*—
Lipets, Adolf U.; Alexandrov, Boris I.; Kuznetsova, Svetlana M.; Okerblom, Jury I.; Ershov, Jury A.; Frolova, Nadezhda A.; Malkis, Valery A.; Sotnikov, Ivan A.; Fedosov, Alexei Z.; and Petrosyan, Robert A., 4,501,320, Cl. 165-144.000.

Spear, John W.: *See*—
Clifton, John T.; and Spear, John W., 4,501,271, Cl. 128-205.130.

Spear, John William: *See*—
Clifton, John T.; and Spear, John W., 4,501,271, Cl. 128-205.130.

Speelman, Paul G. Brace device for motor boat drive unit. 4,501,561, Cl. 440-61.000.

Speicher, Charles G.: *See*—
Acciai, Michael; Pigos, Charles R.; and Speicher, Charles G., 4,502,063, Cl. 346-155.000.

Spencer, Arthur T.: *See*—
Chu, Shaw C.; and Spencer, Arthur T., 4,501,831, Cl. 523-412.000.

Spencer Wright Industries, Inc.: *See*—
Slattery, Ian, 4,501,212, Cl. 112-266.200.

Sperry Corporation: *See*—
Josephs, Richard M.; and Wang, Tsing-Chow, 4,501,975, Cl. 307-277.000.

Spietschka, Ernst; and Troster, Helmut, to Hoechst Aktiengesellschaft. Monoalkali metal salts of perylene-3,4,9,10-tetracarboxylic acid monoanhydride and process for their manufacturing. 4,501,906, Cl. 549-232.000.

Spreadbury, Robert J., to Cooper Industries, Inc. Ballast modifying device and lead-type ballast for programming and controlling the operating performance of an hid sodium lamp. 4,501,994, Cl. 315-307.000.

Springer, Engelbert: *See*—
Hillmann, Hans; and Springer, Engelbert, 4,501,062, Cl. 29-599.000.

Square D Company: *See*—
Kuckuk, William R., 4,502,130, Cl. 365-52.000.

SS Pharmaceutical Co., Ltd.: *See*—
Yokoi, Koichi; Tachibana, Koichi; Isomae, Kazuo; and Nakashima, Toshiaki, 4,501,752, Cl. 514-414.000.

Staat, Karl-Hans; and Moltner, Hermann, to Kocks Technik GmbH & Co. Rolling mill plants. 4,501,134, Cl. 72-8.000.

Stahl, Andre ; Munier, Daniel; and Bertrand, Andre , to Quartz & Electronique Alcatel. Support for an oscillator. 4,502,022, Cl. 331-68.000.

Stahl, Jochen, to Siemens Aktiengesellschaft. Electron tube, especially transmitting tube. with a device for eliminating interfering retarding-field effects. 4,501,990, Cl. 313-299.000.

Stam, Jaap: *See*—
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,501,639, Cl. 159-48.100.

Standard Oil Company, The: *See*—
Greene, Janice L.; and Loza, Roman, 4,501,881, Cl. 528-336.000.

Standard Oil Company (Indiana): *See*—
Stephens, James R., 4,501,880, Cl. 528-322.000.

Stanton, George E., to NuJack Oil Pump Company. Pump jack. 4,501,119, Cl. 60-398.000.

Statewide Pools, Inc.: *See*—
Corna, John F.; and Blais, Marcel H., 4,501,100, Cl. 52-169.700.

Stauffer Chemical Company: *See*—
Mirviss, Stanley B., 4,501,903, Cl. 549-29.000.

Stauffer, Norman L., to Honeywell Inc. Vision illumination system for range finder. 4,501,961, Cl. 250-201.000.

Staveley Machine Tools Limited: *See*—
Archibald, Ronald L., 4,501,092, Cl. 51-165.00R.

Stebegg, Josef; and Becke, Gerhart, to Siemens Aktiengesellschaft. Cable terminal element. 4,501,463, Cl. 339-99.00R.

Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Digital television receivers. 4,502,078, Cl. 358-188.000.

Stefanescu Doru M.; and Martinez, Freddy, to University of Alabama, The. Compacted graphite cast irons in the iron-carbon-aluminum system. 4,501,612, Cl. 75-124.000.

Stein, Joseph H.: *See*—
Fenton, Edward A., Jr.; Lakin, Ira W.; Stein, Joseph H.; Lohr, John R.; and Schreiber, David A., 4,501,539, Cl. 425-84.000.

Steiner, Karl: *See*—
Jenkner, Karl; Steiner, Karl; and Wolf, Robert, 4,501,075, Cl. 34-125.000.

Stencel Aero Engineering Corporation: *See*—
Duncan, James W., 4,501,362, Cl. 206-525.000.

Stengl, Jens P.: *See*—
Leipold, Ludwig; Stengl, Jens P.; and Tihanyi, Jeno , 4,502,070, Cl. 357-38.000.

Stephens, James R., to Standard Oil Company (Indiana). Copolyoxadiazole-imide containing 5-tertiary butyl phenylene moiety. 4,501,880, Cl. 528-322.000.

Stewart, Louie J. Pool game apparatus. 4,501,423, Cl. 273-122.00R.

Stewart, Ronald L.: *See*—
Miller, Stephen B.; Stewart, Ronald L.; and Thompson, David A., 4,501,602, Cl. 65-18.200.

Stilin, John J., to Falk Corporation, The. Two speed gear drive with reversible input and unidirectional output. 4,501,169, Cl. 74-812.000.

Stockburger, Hermann; and Winderlich, Hans-Georg. Method and apparatus for aligning flat data supports. 4,501,959, Cl. 235-485.000.

Stockdale, Trevor J.; and Churchill, John E., to U.S. Philips Corporation. Automatic sampling arrangement. 4,501,164, Cl. 73-864.250.

Stone, David A., to Stone Fly Products. Applicator for fishing line dressing composition. 4,501,222, Cl. 118-234.000.

Stone Fly Products: *See*—
Stone, David A., 4,501,222, Cl. 118-234.000.

Stone, George C.; and Ross, Stuart E., to CBS Inc. Manual controller for video system. 4,501,424, Cl. 273-148.00B.

Stone, William J., to United States of America, Energy. Front lighted shadowgraphic method and apparatus. 4,501,473, Cl. 350-407.000.

Storage Technology Corporation: *See*—
Hill, John P.; and Touchton, James J., 4,502,021, Cl. 330-279.000.

Storage Technology Partners II: *See*—
Manes, Kenneth L.; and Hart, William D., 4,502,099, Cl. 361-383.000.
Rickert, David W.; Wilkinson, Richard A., Jr.; and Hunt, William C., 4,502,136, Cl. 369-271.000.

Stout, Ronald L.: *See*—
Fowler, Glenn D.; Shannon, Patrick A.; Stout, Ronald L.; and Yao, Jean, 4,502,116, Cl. 364-200.000.

Straayer, Robert O., to Evolution Enterprises, Inc. Hand carried portable weeder convertible to a cultivator apparatus. 4,501,332, Cl. 172-41.000.

Straubel, Max: *See*—
Stumpp, Gerhard; Vogtmann, Hans-Jorg; Fussner, Paul; Schwarz, Manfred; Hofer, Gerald; Konrath, Karl; Straubel, Max; and Faupel, Werner, 4,501,252, Cl. 123-502.000.

Strobel, Klaus; and Geiger, Klaus, to Hutschenreuther Aktiengesellschaft. Method for molding a ceramic article. 4,501,714, Cl. 264-245.000.

Stryjewski, Walter A., to Eastman Kodak Company. Member of compliant material. 4,501,482, Cl. 355-3.0FU.
Stuart, Frank A.: *See*—
Tyson, William H.; and Stuart, Frank A., 4,501,670, Cl. 210-770.000.
Stumpp, Gerhard; Vogtmann, Hans-Jorg; Fussner, Paul; Schwarz, Manfred; Hofer, Gerald; Konrath, Karl; Straubel, Max; and Faupel, Werner, to Robert Bosch GmbH. Fuel injection pump. 4,501,252, Cl. 123-502.000.
Sturdevant, Eugene J., to Proctor-Silex, Inc. Mechanical electrode. 4,501,954, Cl. 219-399.000.
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn. Pressure regulating mechanically and electrically operable shut off valves. 4,501,290, Cl. 137-495.000.
Su, Dean T., to Colgate-Palmolive Company. Gels formed from anionic and cationic polymers. 4,501,834, Cl. 524-28.000.
Suda, Michael: *See*—
Kwentus, Gerald K.; and Suda, Michael, 4,501,907, Cl. 549-259.000.
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, to Kabushiki Kaisha Kobe Seiko Sho. High strength steel plate and method for manufacturing same. 4,501,626, Cl. 148-36.000.
Sugano, Kazuhiko, to Nissan Motor Company, Limited. Hydraulic control system for automatic transmission. 4,501,174, Cl. 74-869.000.
Sugimori, Masaru; Sanji, Koichiro; Tomoyasu, Hirohide; and Sakakibara, Toshimori, to Sunstar Giken Kabushiki Kaisha. Epoxy resin composition and method for the preparation of the same. 4,501,853, Cl. 525-122.000.
Sugimoto, Goro: *See*—
Matsuno, Sadayuki; Itoh, Hiroshi; Nishikawa, Isamu; Awazu, Tatsuo; Matsunaga, Toshio; Kitaoka, Yoshitaka; Sugimoto, Goro; and Nishisaka, Hiroki, 4,501,223, Cl. 118-668.000.
Sugita, Yutaka: *See*—
Suzuki, Ryo; Hiroshima, Minoru; Takeshita, Masatoshi; and Sugita, Yutaka, 4,502,129, Cl. 365-8.000.
Suhre, Dennis R., to Westinghouse Electric Corp. Gain tuned laser resonator. 4,502,144, Cl. 372-23.000.
Suling, Carlhans: *See*—
Konig, Joachim; Suling, Carlhans; and Korte, Siegfried, 4,501,865, Cl. 526-71.000.
Sullivan, Dennis K.: *See*—
Thedford, Guy N.; Fachini, Robert M.; and Sullivan, Dennis K., 4,501,112, Cl. 56-13.300.
Sulser, Ulrich: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,501,839, Cl. 524-247.000.
Sumitomo Chemical Company, Limited: *See*—
Kato, Toshiro; Takahashi, Junya; and Kamoshita, Katsuzo, 4,501,756, Cl. 514-120.000.
Terashima, Shiro; Tamoto, Katsumi; and Koga, Kenji, 4,501,700, Cl. 260-351.500.
Sumitomo Durez Company, Ltd.: *See*—
Nakamura, Masayuki; Tsuriya, Masaaki; and Funabashi, Masahiko, 4,501,836, Cl. 524-66.000.
Sumitomo Electric Industries, Ltd.: *See*—
Tsukamoto, Shinya; Takahashi, Kunihiro; and Doi, Akira, 4,501,717, Cl. 419-58.000.
Sumskoi Filial Kharkovskogo Politekhnicheskogo Instituta: *See*—
Kholin, Boris G., 4,501,257, Cl. 124-81.000.
Sun, Eleanor: *See*—
Holmes, Rory A.; and Sun, Eleanor, 4,501,792, Cl. 428-299.000.
Sunaga, Yasumasa, to Fuji Photo Optical Co., Ltd. Lens adapter for endoscopes. 4,501,477, Cl. 350-560.000.
Sundstrand Corporation: *See*—
Glennon, Timothy F., 4,502,106, Cl. 363-56.000.
Sung, Rodney L.; and Karol, Thomas J., to Texaco Inc. Middle distillate fuel oil of improved storage stability containing condensate of Mannich base and alkenyl succinic acid anhydride. 4,501,595, Cl. 44-57.000.
Sung, Rodney L.: *See*—
Karol, Thomas J.; and Sung, Rodney L., 4,501,597, Cl. 44-63.000.
Sunstar Giken Kabushiki Kaisha: *See*—
Sugimori, Masaru; Sanji, Koichiro; Tomoyasu, Hirohide; and Sakakibara, Toshimori, 4,501,853, Cl. 525-122.000.
Super, Scott S.; Hsu, Joseph C.; Haffner, William B.; and Jesse, Jerry F., to American Can Company. Unbalanced oriented multiple layer film. 4,501,797, Cl. 428-349.000.
Super, Scott S.: *See*—
Koschak, Matthew; Super, Scott S.; and Jesse, Jerry F., 4,501,798, Cl. 428-349.000.
Suroff, Leonard W.: *See*—
Kolt, Stanley, 4,501,389, Cl. 236-49.000.
Surtani, Kishin: *See*—
Culley, Bobby G.; and Surtani, Kishin, 4,501,471, Cl. 350-334.000.
Suzaki, Masayuki; and Kanno, Tetuo, to Ricoh Company, Ltd. Printer carriage and hammer assembly. 4,501,509, Cl. 400-157.200.
Suzuki, Fujio: *See*—
Kidoh, Kunizoh; Wakamori, Hideki; Suzuki, Fujio; and Iwasaki, Takao, 4,501,870, Cl. 526-344.100.
Suzuki, Katsuhiko; and Naganuma, Seihachi, to Mitsubishi Denki Kabushiki Kaisha; Tokyo Rope Mfg., Co., Ltd.; and Hakko Kouyu Co., Ltd. Traction type elevator system. 4,501,115, Cl. 57-220.000.
Suzuki, Katsumi; and Yoshizawa, Shuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Film depositing apparatus and a film depositing method. 4,501,766, Cl. 427-38.000.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Opposed contact switch. 4,501,940, Cl. 200-16.00A.
Suzuki, Nobuyuki: *See*—
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,501,481, Cl. 354-413.000.
Suzuki, Ryo; Hiroshima, Minoru; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble detector. 4,502,129, Cl. 365-8.000.
Suzuki, Ryoichi; and Yamaguchi, Yoshio, to Janome Sewing Machine Industry Co., Ltd. Instant thread dyeing method for sewing machine. 4,501,588, Cl. 8-444.000.
Suzuki, Ryoichi; and Yamaguchi, Yoshio, to Janome Sewing Machine Industry Co., Ltd. Instant thread dyeing method for sewing machines. 4,501,590, Cl. 8-495.000.
Sweat, William T., to ASARCO Incorporated. Non-polluting heat recuperative sintering method and apparatus. 4,501,412, Cl. 266-178.000.
Swedo, Raymond J.: *See*—
Malloy, Thomas P.; and Swedo, Raymond J., 4,501,675, Cl. 252-8.55D.
Swenson, Paul F., Jr.: *See*—
Gerstmann, Joseph; Hauck, William M.; Raymond, Robert; and Swenson, Paul F., Jr., 4,501,253, Cl. 123-527.000.
Swift, Graham: *See*—
Baus, Richard E.; and Swift, Graham, 4,501,845, Cl. 524-460.000.
Synthelabo: *See*—
Kaplan, Jean-Pierre; and George, Pascal, 4,501,745, Cl. 514-222.000.
Syva Company: *See*—
Gibbons, Ian; Rowley, Gerald L.; and Ullman, Edwin F., 4,501,692, Cl. 260-112.00B.
Szklarczyk, Marek: *See*—
Bockris, John O.; Szklarczyk, Marek; and Contractor, Aliasgar Q., 4,501,804, Cl. 429-111.000.
Tabe, Tsutomu: *See*—
Omori, Norio; Tabe, Tsutomu; Ito, Katsunori; and Hayashi, Shuukichi, 4,501,250, Cl. 123-486.000.
Tachibana, Koichi: *See*—
Yokoi, Koichi; Tachibana, Koichi; Isomae, Kazuo; and Nakashima, Toshiaki, 4,501,752, Cl. 514-414.000.
Taft, Philip A.: *See*—
Reynolds, Desmond H.; and Taft, Philip A., 4,501,451, Cl. 303-6.00A.
Taiho Seiki Kabushiki Kaisha: *See*—
Yanagisawa, Taminori; Yamaguchi, Takaharu; and Fukatsu, Hiroshi, 4,501,352, Cl. 198-775.000.
Taira, Shigeo, to Diesel Kiki Co., Ltd. Fuel injection valve with variable lifting amount of the nozzle needle. 4,501,245, Cl. 123-446.000.
Takahashi, Fumio: *See*—
Kawano, Junji; and Takahashi, Fumio, 4,502,057, Cl. 346-76.0PH.
Takahashi, Hisamitsu: *See*—
Kimura, Minoru; and Takahashi, Hisamitsu, 4,502,032, Cl. 336-58.000.
Takahashi, Junya: *See*—
Kato, Toshiro; Takahashi, Junya; and Kamoshita, Katsuzo, 4,501,756, Cl. 514-120.000.
Takahashi, Kunihiro: *See*—
Tsukamoto, Shinya; Takahashi, Kunihiro; and Doi, Akira, 4,501,717, Cl. 419-58.000.
Takahashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Control center having cabinet with improved lateral strength and safety. 4,502,097, Cl. 361-342.000.
Takahashi, Mitsuharu: *See*—
Shibayama, Tooru; Kajiya, Hiroshi; and Takahashi, Mitsuharu, 4,501,224, Cl. 118-697.000.
Takahashi, Sumio: *See*—
Kushida, Hideo; Takahashi, Sumio; and Koshio, Shuichi, 4,501,781, Cl. 428-35.000.
Takahashi, Yuji; Masaki, Hisaji; Adachi, Muneo; and Igarashi, Masaru, to Canon Kabushiki Kaisha. Collator having a transfer capability. 4,501,419, Cl. 271-288.000.
Takahata, Kyoya: *See*—
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.
Takai, Denei: *See*—
Sudo, Masatoshi; Hori, Hiromi; Iwai, Takafusa; Ohtomo, Akinori; and Takai, Denei, 4,501,626, Cl. 148-36.000.
Takano, Akira: *See*—
Kubota, Hirotoshi; Takano, Akira; Arai, Isao; and Matsuzaka, Masayoshi, 4,501,397, Cl. 244-75.00R.
Takano, Eiji: *See*—
Tanaka, Shoichi; Tanaka, Yoshiharu; and Takano, Eiji, 4,501,691, Cl. 252-631.000.
Takase, Muneaki: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,501,736, Cl. 424-195.000.
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kabushiki Kaisha. Apparatus for measuring tire uniformity. 4,501,141, Cl. 73-146.000.
Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Hiroshima, Minoru; Takeshita, Masatoshi; and Sugita, Yutaka, 4,502,129, Cl. 365-8.000.

Takesue, Masahiko: *See*—
Katayama, Takao; and Takesue, Masahiko, 4,501,678, Cl. 252-32.70E.
Takeuchi, Takashi; Kobayashi, Syoji; Ootani, Tsuyoshi; and Imamura, Tetsuya, to Kao Corporation. Magnetic recording medium. 4,501,795, Cl. 428-329.000.
Talo, Arnold T. Retracting and locking animal leash. 4,501,230, Cl. 119-109.000.
Tamoto, Katsumi: *See*—
Terashima, Shiro; Tamoto, Katsumi; and Koga, Kenji, 4,501,700, Cl. 260-351.500.
Tamura, Jun; Matsui, Takahiro; and Hozumi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Balancing device for dental arm. 4,501,557, Cl. 433-79.000.
Tan, Yoichi, to Fuji Xerox Co., Ltd. Digital signal transmitting method. 4,502,137, Cl. 370-85.000.
Tanabe, Hisaki: *See*—
Umemoto, Hirotoshi; Tanabe, Hisaki; Yamada, Mitsuo; and Nakano, Shinji, 4,501,863, Cl. 525-443.000.
Tanaka, Akira: *See*—
Mizuhara, Hisayoshi; Omori, Shigenori; and Tanaka, Akira, 4,501,547, Cl. 425-391.000.
Saikawa, Masahiko; Kanada, Eiji; Tanaka, Akira; and Endo, Kazunaka, 4,501,811, Cl. 430-204.000.
Tanaka, Mitsuo; and Kozakae, Kunitoshi, to Bridgestone Cycle Co., Ltd. Power transmission mechanism. 4,501,576, Cl. 474-141.000.
Tanaka, Osamu; and Yata, Noboru, to Wakunaga Yakuhin Kabushiki Kaisha. Promotion of absorption of drugs administered through the alimentary system. 4,501,734, Cl. 514-198.000.
Tanaka, Shinichiro: *See*—
Aoki, Keiji; and Tanaka, Shinichiro, 4,501,137, Cl. 73-35.000.
Tanaka, Shoichi; Tanaka, Yoshiharu; and Takano, Eiji, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for treating a radioactive liquid waste. 4,501,691, Cl. 252-631.000.
Tanaka, Yoshiharu: *See*—
Tanaka, Shoichi; Tanaka, Yoshiharu; and Takano, Eiji, 4,501,691, Cl. 252-631.000.
Taniguchi, Keishi; and Iiyama, Kiyotaka, to Ricoh Company, Ltd. Thermosensitive recording material. 4,502,068, Cl. 346-216.000.
Tanimoto, Yoshio: *See*—
Aizawa, Makoto; Kishimoto, Tsuneo; and Tanimoto, Yoshio, 4,501,790, Cl. 428-283.000.
Tann-Papier Gesellschaft m.b.H.: *See*—
Hollinetz, Walter, 4,501,953, Cl. 219-384.000.
Tanner, Murray Q., III: *See*—
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Delmege, Arthur H.; El-Ibiary, Yehia M.; Rode, Melvin A.; and Taplin, Lael B., 4,502,109, Cl. 364-174.000.
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Yoshizawa, Keiichi, 4,501,359, Cl. 206-387.000.
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Carlson, Roland W.; and Blaskis, Edward A., 4,501,566, Cl. 445-28.000.
Technology Unlimited, Inc.: *See*—
Geho, W. Blair; and Lau, John R., 4,501,728, Cl. 424-38.000.
Technomed Elektromed.Apparatebau GmbH: *See*—
Kunst, Hermann, 4,502,062, Cl. 346-155.000.
Teijin Limited: *See*—
Hirakawa, Tadashi; and Yoshida, Makoto, 4,501,641, Cl. 162-164.300.
Tekniska Rontgencentralen AB: *See*—
Engding, Alf, 4,501,716, Cl. 376-249.000.
Tektronix, Inc.: *See*—
Olmstead, Harold W.; Andrews, Jary D.; and Walquist, Clayton C., 4,501,995, Cl. 315-371.000.
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Mostyn, William T., Jr., 4,501,932, Cl. 179-16.0AA.
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Teraura, Makoto; and Baba, Masanao, to Nippon Cable System, Inc. Steering system for a boat. 4,501,218, Cl. 114-144.00R.
Terrels, Joseph L. Paint cup for sprayer. 4,501,500, Cl. 366-250.000.
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Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,501,704, Cl. 260-465.00R.
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, 4,501,894, Cl. 548-186.000.
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Arnold, Dan M., 4,501,964, Cl. 250-270.000.
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Culley, Bobby G.; and Surtani, Kishin, 4,501,471, Cl. 350-334.000.
Dyer, Lawrence D.; and McGregor, Anderson D., 4,501,258, Cl. 125-13.00R.
Grenier, Aime J., 4,502,033, Cl. 337-75.000.
Tregilgas, John H.; Beck, Jeffrey D.; Kinch, Michael A.; and Schaake, Herbert F., 4,501,625, Cl. 148-20.300.
Van Der Ploeg, Arie; Jansen, Wim; and Gerson, Philips, 4,501,255, Cl. 123-557.000.
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Nelson, Alfred W., 4,501,404, Cl. 248-503.100.
Th. Goldschmidt AG: *See*—
Fink, Hans-Ferdi; Koerner, Gotz; and Freiberger, Rolf, 4,501,616, Cl. 106-38.220.
Koerner, Gotz; and Weitemeyer, Christian, 4,501,911, Cl. 556-446.000.
Thayer, Timothy Z.; and Shaw, Frank W., to Arvin Industries, Inc. Catalytic converter housing. 4,501,118, Cl. 60-301.000.
Thedford, Guy N.; Fachini, Robert M.; and Sullivan, Dennis K., to International Harvester Co. Cotton harvesting machine pneumatic duct system. 4,501,112, Cl. 56-13.300.
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Thomas, Bruce E.: *See*—
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Thomas, Delbert D. Apparatus for the selective retorting of carbonaceous materials. 4,501,644, Cl. 202-99.000.
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Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,502,150, Cl. 381-70.000.
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Thompson, Roger A., to Adolph Coors Company. Photomultiplier tube assembly. 4,501,366, Cl. 209-556.000.
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Dupressoir, Albert; and Salvat, Francois, 4,502,053, Cl. 343-727.000.
Heitzmann, Michel, 4,502,023, Cl. 331-107.00R.
Le Parquier, Guy; and Puech, Claude, 4,502,037, Cl. 340-347.0AD.
Rouge, Jean, 4,501,150, Cl. 73-628.000.
Thomson, John G., to Gall Thomson Maritime Limited. Breakaway coupling. 4,501,287, Cl. 137-68.00R.
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Tokyo Rope Mfg., Co., Ltd.: *See*—
Suzuki, Katsuhiko; and Naganuma, Seihachi, 4,501,115, Cl. 57-220.000.
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Arabori, Yoshinari; and Sato, Hisao, 4,501,945, Cl. 219-10.55F.
Ariga, Yoshio; Miyano, Toshiyuki; and Wakisaka, Yukinori, 4,501,418, Cl. 271-187.000.
Eguchi, Kazutoshi, 4,502,115, Cl. 364-200.000.
Hibi, Toshio, 4,502,050, Cl. 340-870.010.
Hongo, Hironobu, 4,501,277, Cl. 128-660.000.
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Matsumoto, Shuji, 4,501,613, Cl. 75-240.000.
Nishikawa, Meisei; Nagumo, Masahide; and Kojima, Tadashi, 4,502,024, Cl. 332-9.00R.
Oda, Goro, 4,501,620, Cl. 134-6.000.
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Suzuki, Katsumi; and Yoshizawa, Shuji, 4,501,766, Cl. 427-38.000.
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Sugimori, Masaru; Sanji, Koichiro; Tomoyasu, Hirohide; and Sakakibara, Toshimori, 4,501,853, Cl. 525-122.000.
Tomsyck, John P.; and Zohn, Thomas J., to Minnesota Mining and Manufacturing Company. Video cassette time left gauge. 4,501,396, Cl. 242-199.000.
Tonomura, Yoshinobu: *See*—
Miyamoto, Koichi; and Tonomura, Yoshinobu, 4,501,490, Cl. 355-55.000.
Torii, Kuniyoshi; and Egma, Chikashi, to Shiraimatsu Shinyaku Company Ltd. Deodorant compositions. 4,501,730, Cl. 424-76.000.
Toro Company, The: *See*—
Hunter, Edwin J., 4,501,391, Cl. 239-97.000.
Totani, Shinzo: *See*—
Minami, Kazuaki; Totani, Shinzo; Miura, Kunio; Akutsu, Kazushi; and Ohyama, Shinji, 4,502,123, Cl. 364-424.000.
Toto Limited: *See*—
Tsutsui, Osamu; Murakami, Shusaku; Kuwahara, Hidehiko; and Yasunaga, Shigefumi, 4,501,261, Cl. 126-351.000.
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Clemence, Francois; Medici, Italo; Fournex, Robert; and Tournemine, Colette, 4,501,740, Cl. 514-283.000.
Toussaint, Margaret W.: *See*—
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Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., to Ranks Hovis McDougall Ltd. Production of edible protein-containing substances. 4,501,765, Cl. 426-656.000.
Toyo Engineering Corporation: *See*—
Nioh, Susumu; Hirayama, Hiroshi; Honda, Tetsuzo; and Ishida, Koji, 4,501,773, Cl. 427-213.000.
Toyo Linoleum Company, Limited: *See*—
Hiragami, Yoshiaki; Yabu, Mikio; and Kawaguchi, Yozi, 4,501,783, Cl. 428-147.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Katsura, Tadahiko; Hirota, Kazumi; and Ueno, Hiroshi, 4,501,375, Cl. 220-270.000.
Toyoda Gosei Co., Ltd.: *See*—
Kuniyoshi, Toru; and Okumoto, Ryoji, 4,501,432, Cl. 277-168.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Yoneda, Takao; and Sakakibara, Yasuji, 4,502,125, Cl. 364-474.000.
Toyoda, Noriyuki: *See*—
Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,737, Cl. 514-167.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Aoki, Keiji; and Tanaka, Shinichiro, 4,501,137, Cl. 73-35.000.
Kako, Hiroyoshi; Kobayashi, Nobuo; and Kaneyuki, Toshiaki, 4,501,540, Cl. 425-116.000.
Niimi, Yukihide; Yoshida, Seietsu; and Ohnaka, Hidemi, 4,501,242, Cl. 123-440.000.
Niimi, Yukihide; Kinoshita, Kenzi; and Urushidani, Masahiro, 4,501,243, Cl. 123-440.000.
Saito, Tadashi, 4,501,167, Cl. 74-467.000.
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, 4,501,141, Cl. 73-146.000.
Yanagisawa, Taminori; Yamaguchi, Takaharu; and Fukatsu, Hiroshi, 4,501,352, Cl. 198-775.000.
Tracy, Wayne R., to Incom International, Inc. Chain assembly with plug-in module. 4,501,351, Cl. 198-648.000.
Trane Company, The: *See*—
Han, Doyoung, 4,501,125, Cl. 62-175.000.
Trans-Cryption, Inc.: *See*—
Perlman, Marvin; and Goldfine, Milton, 4,501,957, Cl. 235-379.000.
Tregilgas, John H.; Beck, Jeffrey D.; Kinch, Michael A.; and Schaake, Herbert F., to Texas Instruments Incorporated. Method of producing homogeneously doped HgCdTe which contains a fast diffusing dopant impurity. 4,501,625, Cl. 148-20.300.
Treiber, Fritz F.; and Bowers, Russell E., to Hobart Corporation. Wrapping control system for film wrapping machine. 4,501,106, Cl. 53-66.000.
Treiber, Fritz F.: *See*—
Rogers, Robert M.; Treiber, Fritz F.; and Bowers, Russell E., 4,501,105, Cl. 53-64.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Process for preparing acyl trimethyl cyclohexene derivatives and use of intermediates therefor in augmenting or enhancing the aroma or taste of a consumable material. 4,501,762, Cl. 426-538.000.
Treuner, Uwe D.: *See*—
Breuer, Hermann; Treuner, Uwe D.; and Denzel, Theodor, 4,501,743, Cl. 514-201.000.
Trigourea, Spiridon, to Snyder General Corporation. Mounting curb for multiple unit air conditioning system. 4,501,193, Cl. 98-33.100.
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Hadermann, Albert F.; Trippe, Jerry C.; and Waters, Paul F., 4,501,828, Cl. 523-309.000.
Trivedi, Bharat; Hamilton, Harriet; and Moos, Walter, to Warner-Lambert Company. N6-(1- and 2-benzocycloalkyl) adenosines. 4,501,735, Cl. 514-46.000.
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Spietschka, Ernst; and Troster, Helmut, 4,501,906, Cl. 549-232.000.
Trouilhet, Yves: *See*—
Boegli, Jean-Charles; and Trouilhet, Yves, 4,501,145, Cl. 73-204.000.
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Tsuchiya, Hiroshi: *See*—
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Tsuda, Shin, to Canon Kabushiki Kaisha. Operation device for facsimile. 4,502,080, Cl. 358-256.000.
Tsudaka, Hideaki, to Mita Industrial Company Limited. Card-operated copying machine. 4,501,485, Cl. 355-6.000.
Tsukada, Kiroku: *See*—
Senuma, Akitaka; Shimizu, Yoshihiko; and Tsukada, Kiroku, 4,501,711, Cl. 264-54.000.
Tsukamoto, Shinya; Takahashi, Kunihiro; and Doi, Akira, to Sumitomo Electric Industries, Ltd. Sintering method using a plasma gas atmosphere. 4,501,717, Cl. 419-58.000.
Tsukamoto, Yukio: *See*—
Higuchi, Seizun; Ooga, Tomonari; Tsukamoto, Yukio; Kamada, Minoru; and Nomura, Yukio, 4,501,802, Cl. 428-629.000.
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Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,501,606, Cl. 71-92.000.
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Tsuzuki, Hanzo, to Casio Computer Co., Ltd. Electronic register. 4,502,119, Cl. 364-405.000.
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Shankar, Srinivasan, 4,501,776, Cl. 427-253.000.
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Real, John D.; Twichell, David J.; and Weed, Lauren R., 4,501,321, Cl. 165-153.000.
Tyson, William H.; and Stuart, Frank A. Recovery of oil and sulfonate from filter cake. 4,501,670, Cl. 210-770.000.
Ube Industries, Ltd.: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Iwayama, Akira; and Umezu, Takashi, 4,501,705, Cl. 260-465.600.
Ueno, Haruo; Ashitaka, Hidetomo; and Nakajima, Koichi, 4,501,867, Cl. 526-136.000.
Ucci, Pompelio A.; and Blyth, Randolph C., to Monsanto Company. Process for conveniently providing stain-resistant polyamide carpets. 4,501,591, Cl. 8-495.000.
Uchida, Hideo: *See*—
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Matsui, Kanenobu; Uchiumi, Shinichiro; Iwayama, Akira; and Umezu, Takashi, 4,501,705, Cl. 260-465.600.
Ueda, Yukihiro: *See*—
Konno, Junichi; Ueda, Yukihiro; Niitsuma, Hiroaki; and Chubachi, Noriyoshi, 4,501,149, Cl. 73-587.000.
Ueno, Haruo; Ashitaka, Hidetomo; and Nakajima, Koichi, to Ube Industries, Ltd. Method for producing a polybutadiene material. 4,501,867, Cl. 526-136.000.

Ueno, Hiroshi: *See*—
Katsura, Tadahiko; Hirota, Kazumi; and Ueno, Hiroshi, 4,501,375, Cl. 220-270.000.
Ueno, Susumu; Kuroda, Kouiti; Kitamura, Hajime; Tohkai, Masaie; Kato, Ken-ichi; and Hiraishi, Nobuyuki, to Hitachi, Ltd.; and Shin-Etsu Chemical Co., Ltd. Roll seal boxes for continuous vacuum treating apparatus. 4,501,428, Cl. 277-12.000.
Ueta, Yutaka: *See*—
Tatemoto, Masayoshi; Oka, Masahiko; Kano, Hideo; Tomoda, Masayasu; and Ueta, Yutaka, 4,501,869, Cl. 526-249.000.
Uherek, Vladimir; and Kersen, Matthew F., to Westinghouse Electric Corp. Speed pattern generator for an elevator car. 4,501,344, Cl. 187-29.00R.
Ulinskas, Gary J., to Whittaker Corporation. Breathing air conservation system. 4,501,270, Cl. 128-202.130.
Ullman, Edwin F.: *See*—
Gibbons, Ian; Rowley, Gerald L.; and Ullman, Edwin F., 4,501,692, Cl. 260-112.00B.
Umehara, Shoji: *See*—
Sakai, Kiyoshi; Ishikawa, Shozo; Arita, Tetsuo; Mabuchi, Minoru; and Umehara, Shoji, 4,501,808, Cl. 430-59.000.
Umemoto, Hirotoshi; Tanabe, Hisaki; Yamada, Mitsuo; and Nakano, Shinji, to Nippon Paint Co., Ltd. Polycarboxylic acid resinous composition, its preparation and coating composition containing the same. 4,501,863, Cl. 525-443.000.
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Umezu, Takashi: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Iwayama, Akira; and Umezu, Takashi, 4,501,705, Cl. 260-465.600.
Underwood, Lance D., to Smith International, Inc. Grease pump for sealed bearing rotary cone rock bits. 4,501,338, Cl. 175-229.000.
Union Carbide Corporation: *See*—
Nausedas, Joseph A., 4,501,542, Cl. 425-133.100.
Pahade, Ravindra F., 4,501,600, Cl. 62-28.000.
Senuma, Akitaka; Shimizu, Yoshihiko; and Tsukada, Kiroku, 4,501,711, Cl. 264-54.000.
Yasuda, Hirotsugu; and van Lier, Johannes A., 4,501,805, Cl. 429-174.000.
Union Oil Company of California: *See*—
Sandiford, Burton B.; Fett, E. Reinold; and Bickford, Harold J., 4,501,324, Cl. 166-250.000.
Young, Dean A.; and Koepke, Jeffery W., 4,501,925, Cl. 585-467.000.
Uniroyal, Inc.: *See*—
Chmiel, Chester T.; and Cotsakis, Daniel J., 4,501,842, Cl. 524-432.000.
United Kingdom Atomic Energy Authority: *See*—
Causer, Roy; and Orr, Donald, 4,501,522, Cl. 414-4.000.
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Air Force: *See*—
Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., 4,501,929, Cl. 174-117.00F.
Valley, Charles R., 4,501,636, Cl. 156-345.000.
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Gaskin, Virginia R.; Horvath, Eugene P.; and Jansson, Richard M., 4,501,131, Cl. 62-514.00R.
Loomis, Jester M., III, 4,501,399, Cl. 244-3.130.
Modzinski, Charles J.; and Devaney, Michael J., 4,501,390, Cl. 237-12.30C.
Rose, Douglas N., 4,501,777, Cl. 427-255.000.
White, Harold V., 4,501,187, Cl. 89-1.800.
Energy: *See*—
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Stone, William J., 4,501,473, Cl. 350-407.000.
Health and Human Services: *See*—
Christman, Chris L., 4,501,151, Cl. 73-646.000.
Interior: *See*—
Morrell, Roger J.; and Larson, David A., 4,501,448, Cl. 299-67.000.
U.S. Philips Corporation: *See*—
Driessen, Antonius J. G. C.; Geertsema, Eise B.; Oomen, Joris J. C.; and Rouwendal, Jan W., 4,501,799, Cl. 428-446.000.
Lamoine, Pierre R., 4,501,479, Cl. 354-275.000.
Lewin, Ian H.; Plummer, Michael J.; and Ward, Rodney, 4,502,094, Cl. 361-234.000.
Stockdale, Trevor J.; and Churchill, John E., 4,501,164, Cl. 73-864.250.
Van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,502,017, Cl. 330-151.000.
Van Roermund, Arthur H. M., 4,502,019, Cl. 330-261.000.
United Technologies Corporation: *See*—
Craig, Harold M.; and Feder, Ernest, 4,501,053, Cl. 29-156.80R.
Drinkuth, William H.; Bires, Robert J.; Miller, Robert J.; and Selleck, Franklin G., 4,501,095, Cl. 51-165.720.
Perkinson, Robert H.; Donnelly, Brian G.; and Dudash, Carl S., 4,501,157, Cl. 73-861.240.
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Dean, Weibley J.; Johnson, Charles E.; and Ragard, Phillip A., 4,501,183, Cl. 83-233.000.
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Yamano, Fumiyuki: *See*—
Okajima, Atsushi; Nitta, Yoshihiko; and Yamano, Fumiyuki, 4,502,128, Cl. 364-900.000.

Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing 24,25-dihydroxycholecalciferol as an active ingredient to treat myodystrophia. 4,501,737, Cl. 514-167.000.

Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing 24,25-dihydroxycholecalciferol as an active ingredient to treat pain, pyrexia or inflammatory diseases. 4,501,738, Cl. 514-167.000.

Yampolsky, Jack S.; and Peszeszer, Endre F., to GA Technologies Inc. Method and apparatus for forming spiral tubing. 4,501,948, Cl. 219-121.0LC.

Yanagawa, Makoto. Photopolymerizable composition. 4,501,689, Cl. 252-600.000.

Yanagisawa, Taminori; Yamaguchi, Takaharu; and Fukatsu, Hiroshi, to Toyota Jidosha Kabushiki Kaisha; and Taiho Seiki Kabushiki Kaisha. Work-conveying apparatus. 4,501,352, Cl. 198-775.000.

Yanagishima, Takayuki; and Seko, Yasutoshi, to Nissan Motor Company, Limited. Method and apparatus for measuring vehicle driver's fatigue to give an alarm. 4,502,122, Cl. 364-424.000.

Yao, Jean: *See*—
Fowler, Glenn D.; Shannon, Patrick A.; Stout, Ronald L.; and Yao, Jean, 4,502,116, Cl. 364-200.000.

Yasuda, Hirotsugu; and van Lier, Johannes A., to Union Carbide Corporation. Galvanic cell having a saturated fluorocarbon plasma-treated sealing gasket. 4,501,805, Cl. 429-174.000.

Yasui, Sosuke: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,501,736, Cl. 424-195.000.

Yasunaga, Shigefumi: *See*—
Tsutsui, Osamu; Murakami, Shusaku; Kuwahara, Hidehiko; and Yasunaga, Shigefumi, 4,501,261, Cl. 126-351.000.

Yasutaka, Hayashi: *See*—
Takayanagi, Shigewo; Hasegawa, Junzo; Yasutaka, Hayashi; Doi, Shunichi; and Matsushima, Satoru, 4,501,141, Cl. 73-146.000.

Yata, Noboru: *See*—
Tanaka, Osamu; and Yata, Noboru, 4,501,734, Cl. 514-198.000.

Yatsuda, Hisao; and Miyazaki, Mutsumi, to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho. Glass for a photomask. 4,501,819, Cl. 501-61.000.

Yauneridge, Raymond: *See*—
Williams, H. Jay; and Yauneridge, Raymond, 4,501,295, Cl. 137-625.190.

Yazu, Kazumasa; Adachi, Yasuto; and Yoshizaki, Takayoshi, to Chisso Corporation. Fine particles of ferromagnetic metal and process for producing the same. 4,501,610, Cl. 75-0.5AA.

Ybern Miro, Pedro. Transmission ratio variators. 4,501,574, Cl. 474-49.000.

Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,501,645, Cl. 203-51.000.

Yeh, Pochi A., to Rockwell International Corporation. Christiansen-Bragg optical filter. 4,501,470, Cl. 350-313.000.

Yoan, Toyohiko; and Muto, Norishige, to Kabushiki Kaisha Komatsu Seisakusho. Drill string element handling apparatus. 4,501,524, Cl. 414-22.000.

Yojigen Agricultural Corporation: *See*—
Odaira, Keikichi, 4,501,604, Cl. 71-15.000.

Yokogawa Hokushin Electric Corporation: *See*—
Yamaguchi, Keiki; and Sano, Shinichi, 4,501,278, Cl. 128-660.000.

Yokoi, Koichi; Tachibana, Koichi; Isomae, Kazuo; and Nakashima, Toshiaki, to SS Pharmaceutical Co., Ltd. Antiulcer drug. 4,501,752, Cl. 514-414.000.

Yokooji, Shigenori: *See*—
Fujiwara, Kaisaku; Yokooji, Shigenori; and Morishita, Yasuji, 4,502,047, Cl. 340-693.000.

Yokoyama, Tatsuro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,501,750, Cl. 514-369.000.

Yoneda, Takao; and Sakakibara, Yasuji, to Toyoda Koki Kabushiki Kaisha. Numerical controller for an angular slide grinding machine. 4,502,125, Cl. 364-474.000.

Yoshida, Kei; Murokawa, Masayuki; and Nomura, Toshiaki, to Chikura Kogyo Kabushiki Kaisha. Automatic door operator for swing doors. 4,501,090, Cl. 49-264.000.

Yoshida Kogyo K. K.: *See*—
Mizuhara, Hisayoshi; Omori, Shigenori; and Tanaka, Akira, 4,501,547, Cl. 425-391.000.

Yoshida, Makoto: *See*—
Hirakawa, Tadashi; and Yoshida, Makoto, 4,501,641, Cl. 162-164.300.

Yoshida, Seietsu: *See*—
Niimi, Yukihide; Yoshida, Seietsu; and Ohnaka, Hidemi, 4,501,242, Cl. 123-440.000.

Yoshida, Takao, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic master cylinder for a motorcycle, or the like. 4,501,340, Cl. 180-219.000.

Yoshikai, Noriaki: *See*—
Kato, Masami; and Yoshikai, Noriaki, 4,502,143, Cl. 371-57.000.

Yoshikumi, Chikao: *See*—
Yamato, Hideyuki; Toyoda, Noriyuki; Fujii, Takayoshi; Maeda, Yuji; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,737, Cl. 514-167.000.
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.

Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, to Asahi-Dow Limited. Cold drawn high-orientation multilayered film and process for manufacture of said film. 4,501,634, Cl. 156-244.240.

Yoshino, Fumisato: *See*—
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,501,738, Cl. 514-167.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Kushida, Hideo; Takahashi, Sumio; and Koshio, Shuichi, 4,501,781, Cl. 428-35.000.

Yoshioka, Hiroshi: *See*—
Kimura, Shigeo; Somezawa, Masashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,501,801, Cl. 428-447.000.

Yoshioka, Kimitomo: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,501,736, Cl. 424-195.000.

Yoshizaki, Takayoshi: *See*—
Yazu, Kazumasa; Adachi, Yasuto; and Yoshizaki, Takayoshi, 4,501,610, Cl. 75-0.5AA.

Yoshizawa, Keiichi, to TDK Corporation. Casing for a video tape cassette. 4,501,359, Cl. 206-387.000.

Yoshizawa, Shuji: *See*—
Suzuki, Katsumi; and Yoshizawa, Shuji, 4,501,766, Cl. 427-38.000.

Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Chemical reaction promoted by catalytically active amorphous silica. 4,501,925, Cl. 585-467.000.

Young, Delton W., to Goodyear Tire & Rubber Company, The. Sole for boots and shoes. 4,501,077, Cl. 36-32.00R.

Young, Raymond H., to Freeport Kaolin Company. Method of conditioning clay for flotation using in situ ferrous activator. 4,501,658, Cl. 209-5.000.

Yuguchi, Hiroya; Hayashi, Yoshinobu; and Miyazaki, Yusuke, to Morinaga Milk Industry Co., Ltd. Process for preparing a sarcocarp-containing jelly. 4,501,763, Cl. 426-573.000.

Yuki, Takeshi: *See*—
Saito, Ken; Ochi, Tsuneo; Furunishi, Kaoru; and Yuki, Takeshi, 4,501,402, Cl. 248-346.000.

Zahr, George E., to Du Pont de Nemours, E. I., and Company. Film-forming poly(conjugated polymethine-type)dye. 4,501,876, Cl. 528-232.000.

Zalewski, Jack J.: *See*—
Anderson, Harry B.; and Zalewski, Jack J., 4,501,937, Cl. 200-5.00A.

Zambon S.p.A.: *See*—
Giordano, Claudio; and Castaldi, Graziano, 4,501,913, Cl. 560-100.000.

Zard, Sammir Z.: *See*—
Barton, Derek H. R.; Motherwell, William B.; and Zard, Sammir Z., 4,501,701, Cl. 260-397.400.

Zellmer, Michael, to AB Volvo. Device for controlling the temperature of the intake air to an internal combustion engine. 4,501,254, Cl. 123-556.000.

Zelnigher, Joseph. Apparatus and method for fabrication of dental prostheses. 4,501,556, Cl. 433-56.000.

Zemek, Albert W.; and Carlsen, Arthur T., to Universal Instruments Corporation. Wire pin insertion method and apparatus. 4,501,065, Cl. 29-845.000.

Zenyaku Kogyo Kabushiki Kaisha: *See*—
Mitsuhashi, Susumu; Takase, Muneaki; Yasui, Sosuke; Washizawa, Ichiro; and Yoshioka, Kimitomo, 4,501,736, Cl. 424-195.000.

Zilahi, Tibor: *See*—
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,501,732, Cl. 424-114.000.

Zimmer, Inc.: *See*—
McDaniel, John M.; and Miller, Clayton R., 4,501,031, Cl. 3-1.911.

Zinbarg, Benson. Desk set with integrally formed swivel clamping means. 4,501,358, Cl. 206-371.000.

Zodrow, Rudolf; and Buchholz, Rainer, to Jagenberg AG. Process for forming a damping connection between two structural elements. 4,501,633, Cl. 156-242.000.

Zohn, Thomas J.: *See*—
Tomsyck, John P.; and Zohn, Thomas J., 4,501,396, Cl. 242-199.000.

Zola, J. Richard; and Prenosil, Stanley W. Receptacle for collection of fuel spills. 4,501,305, Cl. 141-86.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; Muennekehoff, Gerd; and Teich, Udo, Re. 31,839, Cl. 242-35.50A.

Burson, Bob O., to R. E. Phelon Company, Inc. Single core condenser discharge ignition system. Re. 31,837, Cl. 123-601.000.

General Electric Co.: *See*—
Harris, James E.; McFadyen, Robert; Peil, William; and Schmidtz, Nicholas A., Re. 31,840, Cl. 363-97.000.

Harris, James E.; McFadyen, Robert; Peil, William; and Schmidtz, Nicholas A., to General Electric Co. Transformer for use in a static inverter. Re. 31,840, Cl. 363-97.000.

McFadyen, Robert: *See*—
Harris, James E.; McFadyen, Robert; Peil, William; and Schmidtz, Nicholas A., Re. 31,840, Cl. 363-97.000.

Muennekehoff, Gerd: *See*—
Schippers, Heinz; Muennekehoff, Gerd; and Teich, Udo, Re. 31,839, Cl. 242-35.50A.

Peil, William: *See*—
Harris, James E.; McFadyen, Robert; Peil, William; and Schmidtz, Nicholas A., Re. 31,840, Cl. 363-97.000.

Porat, David: *See*—
Seckler, David; and Porat, David, Re. 31,838, Cl. 239-177.00R.

R. E. Phelon Company, Inc.: *See*—
Burson, Bob O., Re. 31,837, Cl. 123-601.000.

Schippers, Heinz; Muennekehoff, Gerd; and Teich, Udo, to Barmag Barmer Maschinenfabrik AG. Bobbin transport apparatus and method. Re. 31,839, Cl. 242-35.50A.

Schmidtz, Nicholas A.: *See*—
Harris, James E.; McFadyen, Robert; Peil, William; and Schmidtz, Nicholas A., Re. 31,840, Cl. 363-97.000.

Seckler, David; and Porat, David, to Valmont Industries, Inc. Irrigation apparatus. Re. 31,838, Cl. 239-177.00R.

Teich, Udo: *See*—
Schippers, Heinz; Muennekehoff, Gerd; and Teich, Udo, Re. 31,839, Cl. 242-35.50A.

Valmont Industries, Inc.: *See*—
Seckler, David; and Porat, David, Re. 31,838, Cl. 239-177.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Anderson, Carl C.; Maska, Rudolf; and Das, Suryya K., to National Starch and Chemical Corporation. High strength pressure-sensitive adhesives. B1 3,769,254, 2-26-85, Cl. 524-398.000.

Das, Suryya K.: *See*—
Anderson, Carl C.; Maska, Rudolf; and Das, Suryya K., B1 3,769,254, Cl. 524-398.000.

Gagliani, John; Lee, Raymond; and Wilcoxson, Anthony L., to IML Corporation. Methods of preparing polyimides and artifacts composed thereof. B1 4,305,796, 2-26-85, Cl. 204-159.190.

IML Corporation: *See*—
Gagliani, John; Lee, Raymond; and Wilcoxson, Anthony L., B1 4,305,796, Cl. 204-159.190.

Lee, Raymond: *See*—
Gagliani, John; Lee, Raymond; and Wilcoxson, Anthony L., B1 4,305,796, Cl. 204-159.190.

Maska, Rudolf: *See*—
Anderson, Carl C.; Maska, Rudolf; and Das, Suryya K., B1 3,769,254, Cl. 524-398.000.

National Starch and Chemical Corporation: *See*—
Anderson, Carl C.; Maska, Rudolf; and Das, Suryya K., B1 3,769,254, Cl. 524-398.000.

Nirschl, Joseph P.: *See*—
Storm, Thomas D.; and Nirschl, Joseph P., B1 4,062,647, Cl. 8-137.000.

Pippert, Frederick B., to Utex Industries, Inc. Anti-extrusion seals and packings. B1 4,219,204, 2-26-85, Cl. 277-188.00A.

Procter & Gamble Company, The: *See*—
Storm, Thomas D.; and Nirschl, Joseph P., B1 4,062,647, Cl. 8-137.000.

Shivvers, Charles C. Apparatus for circulating grain stored in a circular bin. B1 3,765,547, 2-26-85, Cl. 366-131.000.

Storm, Thomas D.; and Nirschl, Joseph P., to Procter & Gamble Company, The. Clay-containing fabric softening detergent compositions. B1 4,062,647, 2-26-85, Cl. 8-137.000.

Utex Industries, Inc.: *See*—
Pippert, Frederick B., B1 4,219,204, Cl. 277-188.00A.

Wilcoxson, Anthony L.: *See*—
Gagliani, John; Lee, Raymond; and Wilcoxson, Anthony L., B1 4,305,796, Cl. 204-159.190.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 277,748, Cl. D13-23.000.

AB Volvo Penta: *See*—
Borgersen, Kjell; and Brandt, Lennart, 277,762, Cl. D15-149.000.
Borgersen, Kjell; and Brandt, Lennart, 277,763, Cl. D15-149.000.

Ahlund, Frank. Angle fitting. 277,728, 2-26-85, Cl. D8-400.000.

Aldrich, Thomas B., III; and Torongo, Albert H., Jr., to Procter & Gamble Company, The. Bottle. 277,733, 2-26-85, Cl. D9-376.000.

Allen, Katherine E. Folding shopper's cart. 277,793, 2-26-85, Cl. D34-17.000.

American Cyanamid Company: *See*—
Harris, Ned, 277,734, Cl. D9-385.000.
Mansau, Serge, 277,730, Cl. D9-300.000.
Mansau, Serge, 277,735, Cl. D9-403.000.

American Hospital Supply Corporation: *See*—
Liston, Max D.; and Hsei, Paul K., 277,788, Cl. D24-99.000.

Arvai, Tibor. Pendant. 277,741, 2-26-85, Cl. D11-79.000.

Ballone, Michael P.: *See*—
Levy, Edward D.; and Ballone, Michael P., 277,715, Cl. D6-571.000.
Levy, Edward D.; and Ballone, Michael P., 277,801, Cl. D34-44.000.

Bechtel, Daniel L. Scope mount for a pellet pistol or the like. 277,773, 2-26-85, Cl. D22-7.000.

Beck, George P. Airway airflow indicator for facilitating blind nasal or blind oral intubation of the trachea and the like. 277,782, 2-26-85, Cl. D24-17.000.

Beck, George P. Airway airflow indicator for facilitating blind nasal or blind oral intubation of the trachea and the like. 277,783, 2-26-85, Cl. D24-17.000.

Becker, Robert W.; and Chuboff, David P., to Zenith Electronics Corporation. Television converter-decoder. 277,754, 2-26-85, Cl. D14-84.000.

Blue Box Toy Factory Limited: *See*—
Takeuchi, Kazutaka, 277,771, Cl. D21-81.000.

Borgersen, Kjell; and Brandt, Lennart, to AB Volvo Penta. Transmission for boats. 277,762, 2-26-85, Cl. D15-149.000.

Borgersen, Kjell; and Brandt, Lennart, to AB Volvo Penta. Transmission for boats. 277,763, 2-26-85, Cl. D15-149.000.

Brandt, Lennart: *See*—
Borgersen, Kjell; and Brandt, Lennart, 277,762, Cl. D15-149.000.
Borgersen, Kjell; and Brandt, Lennart, 277,763, Cl. D15-149.000.

Bretford Manufacturing, Inc.: *See*—
Petrick, David C., 277,717, Cl. D6-495.000.

Brown & Sharpe Manufacturing Company: *See*—
Guertin, Raymond J.; Kang, Chuhong; and Matthews, Peter P., 277,757, Cl. D15-124.000.

Brownline Pipe Inc.: *See*—
Galloway, Cecil, 277,726, Cl. D8-356.000.

Bufkor, Inc.: *See*—
Crawford, Dennis, 277,713, Cl. D6-329.000.

C.S. di NOSENZO Oreste: *See*—
Nosenzo, Oreste G., 277,779, Cl. D23-97.000.

Callas, Michael T.: *See*—
Grammas, Nick G.; and Callas, Michael T., 277,738, Cl. D10-109.000.
Grammas, Nick G.; and Callas, Michael T., 277,739, Cl. D10-109.000.

Chabot, Jean-Marie, to Les Industries Provinciales Ltee. Tote box. 277,797, 2-26-85, Cl. D34-40.000.

Christensen, James M.: *See*—
Sgarlato, Thomas E.; and Christensen, James M., 277,784, Cl. D24-33.000.

Chuboff, David P.: *See*—
Becker, Robert W.; and Chuboff, David P., 277,754, Cl. D14-84.000.

Cillario, Lorenzo, to Ferrero S.p.A. Display stand for confectionery products. 277,711, 2-26-85, Cl. D6-464.000.

Coleco Industries, Inc.: *See*—
Marsh, Susan A.; and Schaefer, George E., 277,772, Cl. D21-134.000.

Coleman, Douglas M., to Coleman Tool and Manufacturing Corp. Lever actuator. 277,759, 2-26-85, Cl. D15-138.000.

Coleman Tool and Manufacturing Corp.: *See*—
Coleman, Douglas M., 277,759, Cl. D15-138.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 277,745, Cl. D12-129.000.

Commodore Electronics Limited: *See*—
Velinsky, Ira, 277,755, Cl. D14-100.000.

Conair Corporation: *See*—
Pajak, Witold, 277,789, Cl. D28-13.000.

Corbett, Sue E. Electrode cap. 277,787, 2-26-85, Cl. D24-34.000.

Crawford, Dennis, to Bufkor, Inc. Jewelry display prop. 277,713, 2-26-85, Cl. D6-329.000.

Crockett & Kelly, Inc.: *See*—
Horst, Paul V., Sr.; Hoyt, Charles D.; and Velazquez, Joseph E., 277,780, Cl. D23-122.000.

Daenen, Robert H. C. M.; and Wolff, Martin J., to Dart Industries Inc. Container closure with capped opening or the like. 277,724, 2-26-85, Cl. D7-392.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Wolff, Martin J., 277,724, Cl. D7-392.000.
Wolff, Martin J., 277,723, Cl. D6-475.000.

Davidson, William G., to Harley-Davidson Motor Co., Inc. Motorcycle engine. 277,756, 2-26-85, Cl. D15-1.000.

De Foyd, Katherine W.: *See*—
Dutton, Derek W.; and De Foyd, Katherine W., 277,712, Cl. D6-334.000.

de Madaria, Sandra D. C. Woven chair seat. 277,718, 2-26-85, Cl. D6-502.000.

DiSesa, Frank, to Tucker Housewares, Inc. Stackable crate. 277,798, 2-26-85, Cl. D34-43.000.

DiSesa, Frank. Holder for utensils. 277,799, 2-26-85, Cl. D34-43.000.

DiSesa, Frank, to Tucker Housewares, Inc. Stackable crate. 277,800, 2-26-85, Cl. D34-43.000.

Drive Line Service, Incorporated: *See*—
Wilson, Louis D.; Wilson, Wesley G.; and Vrilakas, Mark, 277,760, Cl. D15-138.000.

Dutton, Derek W.; and De Foyd, Katherine W. Chair. 277,712, 2-26-85, Cl. D6-334.000.

Eckmann, John A.; Krumin, Donald K.; Toth, Richard J.; and Scheid, William J., to Motorola, Inc. Radio pager or similar article. 277,753, 2-26-85, Cl. D14-70.000.

Engle, Angeline V.: *See*—
Engle, Richard A.; and Engle, Angeline V., 277,710, Cl. D3-54.000.

Engle, Richard A.; and Engle, Angeline V. Key holder for a purse. 277,710, 2-26-85, Cl. D3-54.000.

Ferrero S.p.A.: *See*—
Cillario, Lorenzo, 277,711, Cl. D6-464.000.

Franko, Lloyd; and Lapchynski, Lenard. Lock box. 277,803, 2-26-85, Cl. D99-28.000.

Galente, Richard W. Bow and arrow rack. 277,716, 2-26-85, Cl. D6-552.000.

Galloway, Cecil, to Brownline Pipe Inc. Riser stabilizer for sprinkler system pipes. 277,726, 2-26-85, Cl. D8-356.000.

Gee Associates: *See*—
Levy, Edward D.; and Ballone, Michael P., 277,715, Cl. D6-571.000.
Levy, Edward D.; and Ballone, Michael P., 277,801, Cl. D34-44.000.

Grammas, Nick G.; and Callas, Michael T., to Lamba Systems, Inc. Combined road marker and lock-in sign. 277,738, 2-26-85, Cl. D10-109.000.

Grammas, Nick G.; and Callas, Michael T., to Lamba Systems, Inc. Combined road marker and flashing light. 277,739, 2-26-85, Cl. D10-109.000.

Green, David T., to United States Surgical Corporation. Surgical clip. 277,785, 2-26-85, Cl. D24-27.000.

Griffiths, Edward E. Joy stick console for remote position and engine control of a crane or the like. 277,795, 2-26-85, Cl. D34-35.000.

Guertin, Raymond J.; Kang, Chuhong; and Matthews, Peter P., to Brown & Sharpe Manufacturing Company. Surface grinding machine. 277,757, 2-26-85, Cl. D15-124.000.

Gulyaev, Bronislav I.: *See*—
Korovin, Vyacheslav V.; Kurganov, Vladimir Y.; Gulyaev, Bronislav I.; Shishkin, Konstantin N.; and Kuryshev, Alexandr I., 277,761, Cl. D15-144.000.

Gusrud, Svein A. Chair. 277,722, 2-26-85, Cl. D6-340.000.

Hale, Bruce H.: *See*—
Silkebakken, Jerrold W.; and Hale, Bruce H., 277,725, Cl. D8-40.000.

Harley-Davidson Motor Co., Inc: *See*—
Davidson, William G., 277,756, Cl. D15-1.000.

Harmeson, Harry L. Lips display. 277,740, 2-26-85, Cl. D11-157.000.

Harris, Ned, to American Cyanamid Company. Combined bottle and cap. 277,734, 2-26-85, Cl. D9-385.000.

Hellman, Kosti T.; and Sivonen, Lauri M., to Orion-Yhtyma Oy. Stopper for plastic or glass tubes for use in taking, transportation and preserving bacteriological samples. 277,786, 2-26-85, Cl. D24-29.000.

Henkle, Ted. Piano lid height adjuster block. 277,764, 2-26-85, Cl. D17-9.000.

Hermanson, Merril, to Mr. Christmas Incorporated. Combined scent diffuser and Christmas tree ornament. 277,742, 2-26-85, Cl. D11-125.000.

Hoesch, Christoph, to Vorwerk & Co Elektrowerke KG. Floor cleaner head. 277,792, 2-26-85, Cl. D32-15.000.

Holz-Design Hofman & Schafer GmbH: *See*—
Leifert, Heinz J., 277,720, Cl. D6-306.000.

Horst, Paul V., Sr.; Hoyt, Charles D.; and Velazquez, Joseph E., to Crockett & Kelly, Inc. Space heater. 277,780, 2-26-85, Cl. D23-122.000.

Hoyt, Charles D.: *See*—
Horst, Paul V., Sr.; Hoyt, Charles D.; and Velazquez, Joseph E., 277,780, Cl. D23-122.000.

Hsei, Paul K.: *See*—
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Hunsaker, Gary B. Mud guard for inside of wheel of off-road vehicle. 277,746, 2-26-85, Cl. D12-184.000.

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26	4,501,231
235 C	4,501,232
406 S	4,501,233

CLASS 123

41.86	4,501,234
52 M	4,501,235
193 P	4,501,236
196 W	4,501,237
198 D	4,501,238
261	4,501,239
339	4,501,240
352	4,501,284
367	4,501,241
440	4,501,242
	4,501,243
446	4,501,244
	4,501,245
449	4,501,246
453	4,501,247
478	4,501,248
	4,501,249
486	4,501,250
495	4,501,251
502	4,501,252
527	4,501,253
556	4,501,254
557	4,501,255
601	Re.31,837
651	4,501,256

CLASS 124

81	4,501,257

CLASS 125

13 R	4,501,258

CLASS 126

263	4,501,259
299 R	4,501,260
351	4,501,261
437	4,501,262

CLASS 128

1 R	4,501,263
	4,501,264
1.5	4,501,265
69	4,501,266
84 R	4,501,267
92 E	4,501,268
92 G	4,501,269
202.13	4,501,270
205.13	4,501,271
206.15	4,501,272
207.15	4,501,273
305	4,501,274
402	4,501,275
642	4,501,276
660	4,501,277
	4,501,278
663	4,501,279
677	4,501,280
680	4,501,281

CLASS 130

27 P	4,501,282

CLASS 131

329	4,501,283

CLASS 134

6	4,501,620
17	4,501,621
18	4,501,622
22.18	4,501,623
58 R	4,501,285

CLASS 137

15	4,501,286
68 R	4,501,287
240	4,501,288
315	4,501,289
495	4,501,290
529	4,501,291
533.11	4,501,292
557	4,501,293
614.11	4,501,294
625.19	4,501,295
625.41	4,501,296
625.46	4,501,297
625.48	4,501,298
625.65	4,501,299

CLASS 138

46	4,501,300
96 T	4,501,301
113	4,501,302

CLASS 139

425 A	4,501,303

CLASS 140

103	4,501,304

CLASS 141

86	4,501,305
94	4,501,306
258	4,501,307

CLASS 144

34 R	4,501,310
144.5	4,501,308
193 A	4,501,309

CLASS 148

9 R	4,501,624
20.3	4,501,625
36	4,501,626
437	4,501,627

CLASS 156

62.8	4,501,628
149	4,501,629
159	4,501,630
161	4,501,631
187	4,501,632
242	4,501,633
244.24	4,501,634
273.3	4,501,635
345	4,501,636
630	4,501,637
644	4,501,638

CLASS 159

48.1	4,501,639

CLASS 160

127	4,501,311

CLASS 162

111	4,501,640
164.3	4,501,641
198	4,501,642
286	4,501,643

CLASS 163

5	4,501,312

CLASS 164

404	4,501,313
441	4,501,314
454	4,501,315
463	4,501,316
472	4,501,317

CLASS 165

1	4,501,318
84	4,501,319
144	4,501,320
153	4,501,321

CLASS 166

173	4,501,322
250	4,501,323
	4,501,324
	4,501,325
272	4,501,326
285	4,501,327
288	4,501,328
292	4,501,329
297	4,501,330
	4,501,331

CLASS 172

41	4,501,332
441	4,501,333
832	4,501,334

CLASS 173

12	4,501,335

CLASS 174

93	4,501,927
107	4,501,928
117 F	4,501,929

CLASS 175

61	4,501,336
171	4,501,337
229	4,501,338

CLASS 177

25	4,501,339

CLASS 178

4	4,501,930
18	4,501,931

CLASS 179

16 AA	4,501,932
81 R	4,501,933
146 E	4,501,934
175	4,501,935
184	4,501,936

CLASS 180

219	4,501,340

CLASS 181

250	4,501,341

CLASS 187

8.41 4,501,342
29 R 4,501,343
4,501,344
4,501,345

CLASS 188

218 XL 4,501,346
250 G 4,501,347

CLASS 192

106.1 4,501,348

CLASS 194

1 G 4,501,349

CLASS 198

478 4,501,350
648 4,501,351
775 4,501,352
779 4,501,353

CLASS 200

5 A 4,501,937
4,501,938
6 A 4,501,939
16 A 4,501,940
144 B 4,501,941

CLASS 202

99 4,501,644

CLASS 203

51 4,501,645

CLASS 204

4 4,501,646
23 4,501,647
149 4,501,648
159.19 B1 4,305,796
181 R 4,501,649
198 4,501,650

CLASS 206

77.1 4,501,354
4,501,355
83.5 4,501,356
312 4,501,357
371 4,501,358
387 4,501,359
443 4,501,360
493 4,501,361
525 4,501,362
570 4,501,363
626 4,501,364

CLASS 208

11 R 4,501,651
57 4,501,652
89 4,501,653
92 4,501,654
110 4,501,655
111 4,501,656
350 4,501,657

CLASS 209

5 4,501,658
548 4,501,365
556 4,501,366

CLASS 210

169 4,501,659
209 4,501,660
223 4,501,661
347 4,501,663
391 4,501,662
614 4,501,664
630 4,501,665
688 4,501,666
700 4,501,667
749 4,501,668
770 4,501,669
4,501,670
781 4,501,671

CLASS 211

13 4,501,367
41 4,501,368
133 4,501,369

CLASS 215

219 4,501,370
232 4,501,371
247 4,501,372
252 4,501,373

CLASS 219

10.43 4,501,942
4,501,943
10.55 E 4,501,946
10.55 F 4,501,944
4,501,945
68 4,501,947
121 LC 4,501,948
4,501,949
124.34 4,501,950
243 4,501,951
305 4,501,952
384 4,501,953
399 4,501,954
469 4,501,955
553 4,501,956

CLASS 220

86 R 4,501,374
270 4,501,375
298 4,501,376
314 4,501,377
324 4,501,378

CLASS 221

221 4,501,379
298 4,501,380

CLASS 222

2 4,501,381
63 4,501,382
82 4,501,383

CLASS 224

32 A 4,501,384
319 4,501,385
326 4,501,386

CLASS 228

183 4,501,387

CLASS 229

37 R 4,501,388

CLASS 235

379 4,501,957
382 4,501,958
485 4,501,959
492 4,501,960

CLASS 236

49 4,501,389

CLASS 237

12.3 C 4,501,390

CLASS 239

97 4,501,391
177 R Re.31,838
4,501,392
265.13 4,501,393
296 4,501,394

CLASS 242

35.5 A Re.31,839
199 4,501,396

CLASS 244

3.13 4,501,399
75 R 4,501,397
134 R 4,501,398

CLASS 248

74.1 4,501,400
346 4,501,401
4,501,402
443 4,501,403
503.1 4,501,404

CLASS 250

201 4,501,961
4,501,962
231 SE 4,501,963
270 4,501,964
288 4,501,965
332 4,501,966
338 4,501,967
343 4,501,968
373 4,501,969
458.1 4,501,970
483.1 4,501,971
577 4,501,972

CLASS 251

7 4,501,405
30 4,501,406
141 4,501,407
314 4,501,408
354 4,501,409
366 4,501,410

CLASS 252

8.5 M 4,501,672
8.55 D 4,501,673
4,501,674
4,501,675
12 4,501,676
32.7 E 4,501,678
37.2 4,501,677
77 4,501,679
142 4,501,680
174.12 4,501,681
174.15 4,501,682
301.26 4,501,683
400 A 4,501,684
500 4,501,686
522 R 4,501,687
573 4,501,688
600 4,501,689
628 4,501,690
631 4,501,691

CLASS 256

13.1 4,501,411

CLASS 260

112 B 4,501,692
112 R 4,501,693
123.5 4,501,694
239.57 4,501,695
245.2 R 4,501,696
245.4 4,501,697
245.5 4,501,698
351.1 4,501,699
351.5 4,501,700
397.4 4,501,701
429 R 4,501,702
455 R 4,501,703
465 R 4,501,704
465.6 4,501,705

CLASS 261

44 D 4,501,709
50 R 4,501,706
94 4,501,707
111 4,501,708

CLASS 264

40.1 4,501,710
54 4,501,711
101 4,501,712
176 R 4,501,713
245 4,501,714
248 4,501,715

CLASS 266

178 4,501,412

CLASS 269

43 4,501,413
325 4,501,414

CLASS 270

60 4,501,415

CLASS 271

3.1 4,501,416
124 4,501,417
187 4,501,418
288 4,501,419

CLASS 272

3 4,501,420
96 4,501,421

CLASS 273

1 GC 4,501,422
122 R 4,501,423
148 B 4,501,424
256 4,501,425
277 4,501,426
406 4,501,427

CLASS 277

12 4,501,428
24 4,501,429
59 4,501,430
134 4,501,431
168 4,501,432
188 A B1 4,219,204

CLASS 280

47.26 4,501,433
206 4,501,434
279 4,501,435
666 4,501,436
704 4,501,437

CLASS 281

45 4,501,438

CLASS 283

91 4,501,439

CLASS 285

47 4,501,440
143 4,501,441
190 4,501,442
328 4,501,443

CLASS 290

1 A 4,501,973

CLASS 292

342 4,501,444

CLASS 299

2 4,501,445
9 4,501,446
43 4,501,447
67 4,501,448
81 4,501,449

CLASS 301

13 SM 4,501,450

CLASS 303

6 A 4,501,451

CLASS 305

27 4,501,452

CLASS 307

246 4,501,974
277 4,501,975
456 4,501,976
469 4,501,977
475 4,501,978
494 4,501,979

CLASS 308

3.6 4,501,453

CLASS 310

12 4,501,980
49 R 4,501,981
90 4,501,982
113 4,501,983
261 4,501,984
268 4,501,986
270 4,501,985
313 A 4,501,987

CLASS 312

215 4,501,455
273 4,501,456
314 4,501,457

CLASS 313

93 4,501,988
4,501,989
299 4,501,990
389 4,501,991

CLASS 315

122 4,501,992
248 4,501,993
307 4,501,994
371 4,501,995
4,501,996

CLASS 318

254 4,501,997
568 4,501,998
632 4,501,999

CLASS 320

6 4,502,000
4,502,001

CLASS 323

237 4,502,002
275 4,502,003

CLASS 324

103 P 4,502,004
158 MG 4,502,005
208 4,502,006
307 4,502,007
311 4,502,008
337 4,502,009
338 4,502,010
446 4,502,011
452 4,502,012

CLASS 328

26 4,502,013
110 4,502,014

CLASS 329

166 4,502,015

CLASS 330

146 4,502,016
151 4,502,017
254 4,502,018
261 4,502,019
265 4,502,020
279 4,502,021

CLASS 331

68 4,502,022
107 R 4,502,023

CLASS 332

9 R 4,502,024

CLASS 333

24 R 4,502,025
101 4,502,026
103 4,502,027
109 4,502,028
203 4,502,029

CLASS 335

164 4,502,030
277 4,502,031

CLASS 336

58 4,502,032

CLASS 337

75 4,502,033

CLASS 338

128 4,502,034

CLASS 339

17 L 4,501,458
48 4,501,459
49 R 4,501,460
75 M 4,501,461
93 R 4,501,462
99 R 4,501,463
176 M 4,501,464
176 MP 4,501,465
255 P 4,501,466

CLASS 340

323 B 4,502,035
347 AD 4,502,037
347 DD 4,502,036
365 R 4,502,040
365 S 4,502,038
4,502,039
532 4,502,041
568 4,502,042
588 4,502,043
604 4,502,044
671 4,502,045
682 4,502,046
693 4,502,047
825.31 4,502,048
825.73 4,502,049
870.01 4,502,050

CLASS 343

356 4,502,051
458 4,502,052
727 4,502,053

CLASS 346

75 4,502,054
4,502,055
76 PH 4,502,056
4,502,057
140 R 4,502,058
4,502,059
4,502,060
153.1 4,502,061
155 4,502,062
4,502,063
160 4,502,064
204 4,502,065
209 4,502,066
214 4,502,067
216 4,502,068

CLASS 350

6.1 4,501,467
96.25 4,501,468
313 4,501,470
334 4,501,471
357 4,501,472
407 4,501,473
414 4,501,474
427 4,501,475
520 4,501,476
560 4,501,477
611 4,501,469

CLASS 352

5 4,501,478

CLASS 354

275 4,501,479
298 4,501,480
413 4,501,481

CLASS 355

3 FU 4,501,482
4,501,483
6 4,501,485
15 4,501,484
4,501,486
27 4,501,487
46 4,501,488
54 4,501,489
55 4,501,490

CLASS 356

39 4,501,491
73.1 4,501,492
123 4,501,493
240 4,501,494
244 4,501,495
246 4,501,496
4,501,497

CLASS 357

23.4 4,502,069
38 4,502,070
4,502,071
4,502,072

CLASS 358

10 4,502,073
23 4,502,074
93 4,502,075
160 4,502,076
167 4,502,077
188 4,502,078
243 4,502,079
256 4,502,080
280 4,502,081

CLASS 360

76 4,502,082
99 4,502,083

CLASS 361

23 4,502,084
56 4,502,085
87 4,502,086
119 4,502,087
124 4,502,088
127 4,502,089
153 4,502,090
213 4,502,091
218 4,502,092
231 4,502,093
234 4,502,094
273 4,502,095
308 4,502,096
332 4,502,132
342 4,502,097
383 4,502,098
4,502,099
384 4,502,100
386 4,502,101

CLASS 362

183 4,502,102
249 4,502,103

CLASS 363

26 4,502,104
41 4,502,105
56 4,502,106
97 Re.31,840
133 4,502,107

CLASS 364

170 4,502,108
174 4,502,109
200 4,502,110
4,502,111
4,502,112
4,502,113
4,502,114
4,502,115
4,502,116
4,502,117
4,502,118
405 4,502,119
4,502,120
422 4,502,121
424 4,502,122
4,502,123
442 4,502,124
474 4,502,125
509 4,502,126
900 4,502,127
4,502,128

CLASS 365

8 4,502,129
52 4,502,130
201 4,502,131

CLASS 366

69 4,501,498
131 B1 3,765,547
156 4,501,499
250 4,501,500
336 4,501,501

CLASS 368

47 4,501,502

CLASS 369

34 4,502,133
46 4,502,134
170 4,502,135
271 4,502,136

CLASS 370

85 4,502,137
100 4,502,138
110.2 4,502,139

CLASS 371

28 4,502,140
37 4,502,141
55 4,502,142
57 4,502,143

CLASS 372

23 4,502,144
38 4,502,145

CLASS 374

162 4,501,503
164 4,501,504

CLASS 376

249 4,501,716

CLASS 377

2 4,502,146

CLASS 378

206 4,502,147

CLASSIFICATION OF PATENTS

CLASS 381

7 4,502,148
24 4,502,149
70 4,502,150
4,502,151

CLASS 384

152 4,501,505
619 4,501,454

CLASS 400

124 4,501,506
134 4,501,507
141.1 4,501,508
157.2 4,501,509
616.3 4,501,510

CLASS 403

24 4,501,511
170 4,501,512

CLASS 405

184 4,501,513
227 4,501,514
259 4,501,515
260 4,501,516
283 4,501,517

CLASS 406

25 4,501,518

CLASS 408

101 4,501,519

CLASS 411

21 4,501,520
217 4,501,521

CLASS 414

4 4,501,522
19 4,501,523
22 4,501,524
139 4,501,525
173 4,501,526
225 4,501,527
273 4,501,528
751 4,501,529

CLASS 415

170 A 4,501,530

CLASS 417

63 4,501,531
313 4,501,532
388 4,501,533
440 4,501,535
572 4,501,534

CLASS 418

61 B 4,501,536
150 4,501,537

CLASS 419

49 4,501,718
58 4,501,717

CLASS 422

102 4,501,719
156 4,501,720

CLASS 423

27 4,501,721
242 4,501,722
263 4,501,723
320 4,501,724
573 R 4,501,725

CLASS 424

1.1 4,501,726
16 4,501,727
38 4,501,728
45 4,501,729
76 4,501,730
101 4,501,731
114 4,501,732
195 4,501,736

CLASS 425

9 4,501,538
84 4,501,539
116 4,501,540
117 4,501,541
133.1 4,501,542
191 4,501,543
218 4,501,544
275 4,501,545
388 4,501,546
391 4,501,547
503 4,501,548
542 4,501,549
549 4,501,550

CLASS 426

62 4,501,757
93 4,501,758
96 4,501,759
250 4,501,760
467 4,501,761
538 4,501,762
573 4,501,763
607 4,501,764
656 4,501,765

CLASS 427

38 4,501,766
44 4,501,767
57 4,501,768
95 4,501,769
97 4,501,770
176 4,501,771
208.6 4,501,772
213 4,501,773
215 4,501,774
220 4,501,775
253 4,501,776
255 4,501,777
376.2 4,501,778

CLASS 428

35 4,501,779
4,501,780
4,501,781
57 4,501,782
147 4,501,783
156 4,501,784
195 4,501,785
215 4,501,786
236 4,501,787
240 4,501,788
274 4,501,789
283 4,501,790
286 4,501,791
299 4,501,792
315.5 4,501,793
316.6 4,501,794
329 4,501,795
337 4,501,796
349 4,501,797
4,501,798
446 4,501,799
447 4,501,800
4,501,801
629 4,501,802

CLASS 429

101 4,501,803
111 4,501,804
174 4,501,805

CLASS 430

25 4,501,806
57 4,501,807
59 4,501,808
138 4,501,809
204 4,501,811
302 4,501,810
466 4,501,812

CLASS 432

15 4,501,551
49 4,501,552
59 4,501,553

CLASS 433

24 4,501,554
29 4,501,555
56 4,501,556
79 4,501,557
86 4,501,558

CLASS 434

154 4,501,559

CLASS 435

8 4,501,813
94 4,501,814
284 4,501,815

CLASS 436

34 4,501,816
161 4,501,817

CLASS 440

53 4,501,560
61 4,501,561
4,501,562

CLASS 441

6 4,501,563
20 4,501,564

CLASS 445

28 4,501,566

CLASS 446

430 4,501,567
450 4,501,568
458 4,501,569

CLASS 455

73 4,502,152

CLASS 464

48 4,501,570
111 4,501,571
170 4,501,572
172 4,501,573

CLASS 474

49 4,501,574
74 4,501,575
141 4,501,576
155 4,501,577
201 4,501,578

CLASS 493

45 4,501,579

CLASS 494

85 4,501,565

CLASS 500

231 4,501,918

CLASS 501

1 4,501,818
61 4,501,819

CLASS 502

27 4,501,820
155 4,501,821
162 4,501,822
167 4,501,685
304 4,501,823
339 4,501,824

CLASS 514

17 4,501,733
46 4,501,735
120 4,501,756
167 4,501,737
4,501,738
198 4,501,734
201 4,501,743
202 4,501,741
203 4,501,739
222 4,501,745
226 4,501,742
245 4,501,744
267 4,501,890
283 4,501,740
318 4,501,748
326 4,501,749
342 4,501,747
357 4,501,746
369 4,501,750
374 4,501,751
414 4,501,752
447 4,501,753
456 4,501,754
4,501,755

CLASS 521

29 4,501,826
78 4,501,825

CLASS 523

214 4,501,827
309 4,501,828
400 4,501,829
401 4,501,830
412 4,501,831
414 4,501,832
416 4,501,833

CLASS 524

28 4,501,834
32 4,501,835
66 4,501,836
100 4,501,837
108 4,501,838
247 4,501,839
387 4,501,840
398 B1 3,769,254
411 4,501,841
432 4,501,842
445 4,501,843
451 4,501,844
460 4,501,845
476 4,501,846
502 4,501,847
527 4,501,848
4,501,849
4,501,850
542 4,501,851
591 4,501,852

CLASS 525

122 4,501,853
162 4,501,854
218 4,501,855
240 4,501,856
338 4,501,857
340 4,501,858
356 4,501,859
359.4 4,501,860
421 4,501,861
430 4,501,862
443 4,501,863
484 4,501,864

CLASS 526

71 4,501,865
133 4,501,866
136 4,501,867
208 4,501,868
249 4,501,869
344.1 4,501,870

CLASS 527

313 4,501,871

CLASS 528

18 4,501,872
48 4,501,873
103 4,501,874
196 4,501,875
232 4,501,876
271 4,501,877
286 4,501,878
288 4,501,879
322 4,501,880
336 4,501,881
4,501,882
340 4,501,883
388 4,501,884
501 4,501,885

CLASS 536

57 4,501,886
84 4,501,887
110 4,501,888

CLASS 544

106 4,501,889

CLASS 546

149 4,501,891
270 4,501,892
281 4,501,893

CLASS 548

186 4,501,894
239 4,501,895
251 4,501,896
262 4,501,897
336 4,501,898
432 4,501,899
436 4,501,900
484 4,501,923
532 4,501,901
555 4,501,902

CLASS 549

29 4,501,903
35 4,501,904
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	610	277,714
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	157	277,740
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	70	277,753
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